



# SEQUENCE LISTING

<110> Yaffe, Michael B.  
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Cantley, Lewis C.  
Smerdon, Stephen J.  
Manke, Isaac

<120> Computer Comprising Atomic Coordinates of a PLK-1 Polo-Box Domain  
and Uses Thereof

<130> 01997/545003

<140> US 10/713,978  
<141> 2003-11-14

<150> US 60/487,899  
<151> 2003-07-17

<150> US 60/485,641  
<151> 2003-07-08

<150> US 60/426,132  
<151> 2002-11-14

<160> 126

<170> PatentIn version 3.3

<210> 1  
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<213> Homo sapien

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Met Ser Ala Ala Val Thr Ala Gly Lys Leu Ala Arg Ala Pro Ala Asp  
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Pro Gly Lys Ala Gly Val Pro Gly Val Ala Ala Pro Gly Ala Pro Ala  
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Ala Ala Pro Pro Ala Lys Glu Ile Pro Glu Val Leu Val Asp Pro Arg  
35 40 45

Ser Arg Arg Arg Tyr Val Arg Gly Arg Phe Leu Gly Lys Gly Gly Phe  
50 55 60

Ala Lys Cys Phe Glu Ile Ser Asp Ala Asp Thr Lys Glu Val Phe Ala  
65 70 75 80

Gly Lys Ile Val Pro Lys Ser Leu Leu Leu Lys Pro His Gln Arg Glu  
85 90 95

Lys Met Ser Met Glu Ile Ser Ile His Arg Ser Leu Ala His Gln His  
100 105 110

Val Val Gly Phe His Gly Phe Phe Glu Asp Asn Asp Phe Val Phe Val  
115 120 125

Val Leu Glu Leu Cys Arg Arg Arg Ser Leu Leu Glu Leu His Lys Arg  
130 135 140

Arg Lys Ala Leu Thr Glu Pro Glu Ala Arg Tyr Tyr Leu Arg Gln Ile  
145 150 155 160

Val Leu Gly Cys Gln Tyr Leu His Arg Asn Arg Val Ile His Arg Asp  
165 170 175

Leu Lys Leu Gly Asn Leu Phe Leu Asn Glu Asp Leu Glu Val Lys Ile  
180 185 190

Gly Asp Phe Gly Leu Ala Thr Lys Val Glu Tyr Asp Gly Glu Arg Lys  
195 200 205

Lys Thr Leu Cys Gly Thr Pro Asn Tyr Ile Ala Pro Glu Val Leu Ser  
210 215 220

Lys Lys Gly His Ser Phe Glu Val Asp Val Trp Ser Ile Gly Cys Ile  
225 230 235 240

Met Tyr Thr Leu Leu Val Gly Lys Pro Pro Phe Glu Thr Ser Cys Leu  
245 250 255

Lys Glu Thr Tyr Leu Arg Ile Lys Lys Asn Glu Tyr Ser Ile Pro Lys  
260 265 270

His Ile Asn Pro Val Ala Ala Ser Leu Ile Gln Lys Met Leu Gln Thr  
275 280 285

Asp Pro Thr Ala Arg Pro Thr Ile Asn Glu Leu Leu Asn Asp Glu Phe  
290 295 300

Phe Thr Ser Gly Tyr Ile Pro Ala Arg Leu Pro Ile Thr Cys Leu Thr

|   |   |     |     |     |     |     |
|---|---|-----|-----|-----|-----|-----|
| 305   |   | 310 |     | 315 |     | 320 |
| Ile Pro Pro Arg   | Phe Ser Ile Ala Pro Ser Ser Leu Asp Pro Ser Asn |     |     |     |     |     |
|   | 325   |     | 330 |     | 335 |     |
| Arg Lys Pro Leu Thr Val Leu Asn Lys Gly Leu Glu Asn Pro Leu Pro |   |     |     |     |     |     |
|   | 340   |     | 345 |     | 350 |     |
| Glu Arg Pro Arg Glu Lys Glu Glu Pro Val Val Arg Glu Thr Gly Glu |   |     |     |     |     |     |
|   | 355   |     | 360 |     | 365 |     |
| Val Val Asp Cys His Leu Ser Asp Met Leu Gln Gln Leu His Ser Val |   |     |     |     |     |     |
|   | 370   |     | 375 |     | 380 |     |
| Asn Ala Ser Lys Pro Ser Glu Arg Gly Leu Val Arg Gln Glu Glu Ala |   |     |     |     |     |     |
|   | 385   |     | 390 |     | 395 | 400 |
| Glu Asp Pro Ala Cys Ile Pro Ile Phe Trp Val Ser Lys Trp Val Asp |   |     |     |     |     |     |
|   | 405   |     | 410 |     | 415 |     |
| Tyr Ser Asp Lys Tyr Gly Leu Gly Tyr Gln Leu Cys Asp Asn Ser Val |   |     |     |     |     |     |
|   | 420   |     | 425 |     | 430 |     |
| Gly Val Leu Phe Asn Asp Ser Thr Arg Leu Ile Leu Tyr Asn Asp Gly |   |     |     |     |     |     |
|   | 435   |     | 440 |     | 445 |     |
| Asp Ser Leu Gln Tyr Ile Glu Arg Asp Gly Thr Glu Ser Tyr Leu Thr |   |     |     |     |     |     |
|   | 450   |     | 455 |     | 460 |     |
| Val Ser Ser His Pro Asn Ser Leu Met Lys Lys Ile Thr Leu Leu Lys |   |     |     |     |     |     |
|   | 465   |     | 470 |     | 475 | 480 |
| Tyr Phe Arg Asn Tyr Met Ser Glu His Leu Leu Lys Ala Gly Ala Asn |   |     |     |     |     |     |
|   | 485   |     | 490 |     | 495 |     |
| Ile Thr Pro Arg Glu Gly Asp Glu Leu Ala Arg Leu Pro Tyr Leu Arg |   |     |     |     |     |     |
|   | 500   |     | 505 |     | 510 |     |
| Thr Trp Phe Arg Thr Arg Ser Ala Ile Ile Leu His Leu Ser Asn Gly |   |     |     |     |     |     |
|   | 515   |     | 520 |     | 525 |     |
| Ser Val Gln Ile Asn Phe Phe Gln Asp His Thr Lys Leu Ile Leu Cys |   |     |     |     |     |     |
|   | 530   |     | 535 |     | 540 |     |

Pro Leu Met Ala Ala Val Thr Tyr Ile Asp Glu Lys Arg Asp Phe Arg  
 545 550 555 560

Thr Tyr Arg Leu Ser Leu Leu Glu Glu Tyr Gly Cys Cys Lys Glu Leu  
 565 570 575

Ala Ser Arg Leu Arg Tyr Ala Arg Thr Met Val Asp Lys Leu Leu Ser  
 580 585 590

Ser Arg Ser Ala Ser Asn Arg Leu Lys Ala Ser  
 595 600

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 <223> Synthetic

<220>  
 <221> MISC\_FEATURE  
 <222> (1)..(2)  
 <223> Xaa = Pro or Phe

<220>  
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 <222> (3)..(3)  
 <223> Xaa = Phe, Ala or Gln

<220>  
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 <222> (4)..(4)  
 <223> Xaa = Thr, Gln, His or Met

<220>  
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 <222> (6)..(6)  
 <223> Xaa = phosphorylated Thr or phosphorylated Ser

<220>  
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 <222> (7)..(7)  
 <223> Xaa = Pro or any amino acid

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Xaa Xaa Xaa Xaa Ser Xaa Xaa  
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Met Ala Gly Pro Met Gln Ser Thr Pro Leu Asn Gly Ala Lys Lys  
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 <212> PRT  
 <213> Homo sapiens

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Met Ser Ala Ala Val Thr Ala Gly Lys Leu Ala Arg Ala Pro Ala Asp  
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Pro Gly Lys Ala Gly Val Pro Gly Val Ala Ala Pro Gly Ala Pro Ala  
 20 25 30

Ala Ala Pro Pro Ala Lys Glu Ile Pro Glu Val Leu Val Asp Pro Arg  
 35 40 45

Ser Arg Arg Arg Tyr Val Arg Gly Arg Phe Leu Gly Lys Gly Gly Phe  
 50 55 60

Ala Lys Cys Phe Glu Ile Ser Asp Ala Asp Thr Lys Glu Val Phe Ala  
 65 70 75 80

Gly Lys Ile Val Pro Lys Ser Leu Leu Leu Lys Pro His Gln Arg Glu  
 85 90 95

Lys Met Ser Met Glu Ile Ser Ile His Arg Ser Leu Ala His Gln His  
 100 105 110

Val Val Gly Phe His Gly Phe Phe Glu Asp Asn Asp Phe Val Phe Val

|   |     |     |
|---|-----|-----|
| 115   | 120 | 125 |
| Val Leu Glu Leu Cys Arg Arg Arg Ser Leu Leu Glu Leu His Lys Arg |     |     |
| 130   | 135 | 140 |
| Arg Lys Ala Leu Thr Glu Pro Glu Ala Arg Tyr Tyr Leu Arg Gln Ile |     |     |
| 145   | 150 | 155 |
|   |     | 160 |
| Val Leu Gly Cys Gln Tyr Leu His Arg Asn Arg Val Ile His Arg Asp |     |     |
|   | 165 | 170 |
|   |     | 175 |
| Leu Lys Leu Gly Asn Leu Phe Leu Asn Glu Asp Leu Glu Val Lys Ile |     |     |
|   | 180 | 185 |
|   |     | 190 |
| Gly Asp Phe Gly Leu Ala Thr Lys Val Glu Tyr Asp Gly Glu Arg Lys |     |     |
|   | 195 | 200 |
|   |     | 205 |
| Lys Thr Leu Cys Gly Thr Pro Asn Tyr Ile Ala Pro Glu Val Leu Ser |     |     |
|   | 210 | 215 |
|   |     | 220 |
| Lys Lys Gly His Ser Phe Glu Val Asp Val Trp Ser Ile Gly Cys Ile |     |     |
| 225   | 230 | 235 |
|   |     | 240 |
| Met Tyr Thr Leu Leu Val Gly Lys Pro Pro Phe Glu Thr Ser Cys Leu |     |     |
|   | 245 | 250 |
|   |     | 255 |
| Lys Glu Thr Tyr Leu Arg Ile Lys Lys Asn Glu Tyr Ser Ile Pro Lys |     |     |
|   | 260 | 265 |
|   |     | 270 |
| His Ile Asn Pro Val Ala Ala Ser Leu Ile Gln Lys Met Leu Gln Thr |     |     |
|   | 275 | 280 |
|   |     | 285 |
| Asp Pro Thr Ala Arg Pro Thr Ile Asn Glu Leu Leu Asn Asp Glu Phe |     |     |
|   | 290 | 295 |
|   |     | 300 |
| Phe Thr Ser Gly Tyr Ile Pro Ala Arg Leu Pro Ile Thr Cys Leu Thr |     |     |
| 305   | 310 | 315 |
|   |     | 320 |
| Ile Pro Pro Arg Phe Ser Ile Ala Pro Ser Ser Leu Asp Pro Ser Asn |     |     |
|   | 325 | 330 |
|   |     | 335 |
| Arg Lys Pro Leu Thr Val Leu Asn Lys Gly Leu Glu Asn Pro Leu Pro |     |     |
|   | 340 | 345 |
|   |     | 350 |

Glu Arg Pro Arg Glu Lys Glu Glu Pro Val Val Arg Glu Thr Gly Glu  
 355 360 365

Val Val Asp Cys His Leu Ser Asp Met Leu Gln Gln Leu His Ser Val  
 370 375 380

Asn Ala Ser Lys Pro Ser Glu Arg Gly Leu Val Arg Gln Glu Glu Ala  
 385 390 395 400

Glu Asp Pro Ala Cys Ile Pro Ile Phe Trp Val Ser Lys Trp Val Asp  
 405 410 415

Tyr Ser Asp Lys Tyr Gly Leu Gly Tyr Gln Leu Cys Asp Asn Ser Val  
 420 425 430

Gly Val Leu Phe Asn Asp Ser Thr Arg Leu Ile Leu Tyr Asn Asp Gly  
 435 440 445

Asp Ser Leu Gln Tyr Ile Glu Arg Asp Gly Thr Glu Ser Tyr Leu Thr  
 450 455 460

Val Ser Ser His Pro Asn Ser Leu Met Lys Lys Ile Thr Leu Leu Lys  
 465 470 475 480

Tyr Phe Arg Asn Tyr Met Ser Glu His Leu Leu Lys Ala Gly Ala Asn  
 485 490 495

Ile Thr Pro Arg Glu Gly Asp Glu Leu Ala Arg Leu Pro Tyr Leu Arg  
 500 505 510

Thr Trp Phe Arg Thr Arg Ser Ala Ile Ile Leu His Leu Ser Asn Gly  
 515 520 525

Ser Val Gln Ile Asn Phe Phe Gln Asp His Thr Lys Leu Ile Leu Cys  
 530 535 540

Pro Leu Met Ala Ala Val Thr Tyr Ile Asp Glu Lys Arg Asp Phe Arg  
 545 550 555 560

Thr Tyr Arg Leu Ser Leu Leu Glu Glu Tyr Gly Cys Cys Lys Glu Leu  
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Ser Arg Ser Ala Ser Asn Arg Leu Lys Ala Ser  
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Met Glu Pro Ala Ala Gly Phe Leu Ser Pro Arg Pro Phe Gln Arg Ala  
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Ala Ala Ala Pro Ala Pro Pro Ala Gly Pro Gly Pro Pro Pro Ser Ala  
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Leu Arg Gly Pro Glu Leu Glu Met Leu Ala Gly Leu Pro Thr Ser Asp  
35 40 45

Pro Gly Arg Leu Ile Thr Asp Pro Arg Ser Gly Arg Thr Tyr Leu Lys  
50 55 60

Gly Arg Leu Leu Gly Lys Gly Gly Phe Ala Arg Cys Tyr Glu Ala Thr  
65 70 75 80

Asp Thr Glu Thr Gly Ser Ala Tyr Ala Val Lys Val Ile Pro Gln Ser  
85 90 95

Arg Val Ala Lys Pro His Gln Arg Glu Lys Ile Leu Asn Glu Ile Glu  
100 105 110

Leu His Arg Asp Leu Gln His Arg His Ile Val Arg Phe Ser His His  
115 120 125

Phe Glu Asp Ala Asp Asn Ile Tyr Ile Phe Leu Glu Leu Cys Ser Arg  
130 135 140

Lys Ser Leu Ala His Ile Trp Lys Ala Arg His Thr Leu Leu Glu Pro  
145 150 155 160

Glu Val Arg Tyr Tyr Leu Arg Gln Ile Leu Ser Gly Leu Lys Tyr Leu



|   |     |     |     |  |     |
|---|-----|-----|-----|--|-----|
|   | 165 |     | 170 |  | 175 |
| His Gln Arg Gly Ile Leu His Arg Asp Leu Lys Leu Gly Asn Phe Phe | 180 | 185 | 190 |  |     |
| Ile Thr Glu Asn Met Glu Leu Lys Val Gly Asp Phe Gly Leu Ala Ala | 195 | 200 | 205 |  |     |
| Arg Leu Glu Pro Pro Glu Gln Arg Lys Lys Thr Ile Cys Gly Thr Pro | 210 | 215 | 220 |  |     |
| Asn Tyr Val Ala Pro Glu Val Leu Leu Arg Gln Gly His Gly Pro Glu | 225 | 230 | 235 |  | 240 |
| Ala Asp Val Trp Ser Leu Gly Cys Val Met Tyr Thr Leu Leu Cys Gly | 245 | 250 | 255 |  |     |
| Ser Pro Pro Phe Glu Thr Ala Asp Leu Lys Glu Thr Tyr Arg Cys Ile | 260 | 265 | 270 |  |     |
| Lys Gln Val His Tyr Thr Leu Pro Ala Ser Leu Ser Leu Pro Ala Arg | 275 | 280 | 285 |  |     |
| Gln Leu Leu Ala Ala Ile Leu Arg Ala Ser Pro Arg Asp Arg Pro Ser | 290 | 295 | 300 |  |     |
| Ile Asp Gln Ile Leu Arg His Asp Phe Phe Thr Lys Gly Tyr Thr Pro | 305 | 310 | 315 |  | 320 |
| Asp Arg Leu Pro Ile Ser Ser Cys Val Thr Val Pro Asp Leu Thr Pro | 325 | 330 | 335 |  |     |
| Pro Asn Pro Ala Arg Ser Leu Phe Ala Lys Val Thr Lys Ser Leu Phe | 340 | 345 | 350 |  |     |
| Gly Arg Lys Lys Lys Ser Lys Asn His Ala Gln Glu Arg Asp Glu Val | 355 | 360 | 365 |  |     |
| Ser Gly Leu Val Ser Gly Leu Met Arg Thr Ser Val Gly His Gln Asp | 370 | 375 | 380 |  |     |
| Ala Arg Pro Glu Ala Pro Ala Ala Ser Gly Pro Ala Pro Val Ser Leu | 385 | 390 | 395 |  | 400 |

Val Glu Thr Ala Pro Glu Asp Ser Ser Pro Arg Gly Thr Leu Ala Ser  
405 410 415

Ser Gly Asp Gly Phe Glu Glu Gly Leu Thr Val Ala Thr Val Val Glu  
420 425 430

Ser Ala Leu Cys Ala Leu Arg Asn Cys Ile Ala Phe Met Pro Pro Ala  
435 440 445

Glu Gln Asn Pro Ala Pro Leu Ala Gln Pro Glu Pro Leu Val Trp Val  
450 455 460

Ser Lys Trp Val Asp Tyr Ser Asn Lys Phe Gly Phe Gly Tyr Gln Leu  
465 470 475 480

Ser Ser Arg Arg Val Ala Val Leu Phe Asn Asp Gly Thr His Met Ala  
485 490 495

Leu Ser Ala Asn Arg Lys Thr Val His Tyr Asn Pro Thr Ser Thr Lys  
500 505 510

His Phe Ser Phe Ser Val Gly Ala Val Pro Arg Ala Leu Gln Pro Gln  
515 520 525

Leu Gly Ile Leu Arg Tyr Phe Ala Ser Tyr Met Glu Gln His Leu Met  
530 535 540

Lys Gly Gly Asp Leu Pro Ser Val Glu Glu Val Glu Val Pro Ala Pro  
545 550 555 560

Pro Leu Leu Leu Gln Trp Val Lys Thr Asp Gln Ala Leu Leu Met Leu  
565 570 575

Phe Ser Asp Gly Thr Val Gln Val Asn Phe Tyr Gly Asp His Thr Lys  
580 585 590

Leu Ile Leu Ser Gly Trp Glu Pro Leu Leu Val Thr Phe Val Ala Arg  
595 600 605

Asn Arg Ser Ala Cys Thr Tyr Leu Ala Ser His Leu Arg Gln Leu Gly  
610 615 620

Cys Ser Pro Asp Leu Arg Gln Arg Leu Arg Tyr Ala Leu Arg Leu Leu  
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Arg Asp Arg Ser Pro Ala  
645

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<223> PHOSPHORYLATION

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Pro Met Gln Ser Thr Pro Leu  
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<223> synthetic

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<220>
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<223> Xaa = Met, Tyr, Phe, Ile, Leu, His, or Lys
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<222>  (2)..(2)
<223>  Xaa = Ala, His, Met, Thr, Phe, or Gln
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<221> MISC_FEATURE
<222> (3)..(3)
<223> Xaa = Ser, Ala, Gly, or Thr
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<220>
<221> MISC_FEATURE
<222> (4)..(4)
<223> Xaa = Phosphorylated Serine or Phosphorylated Threonine
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<400> 7

Xaa Xaa Xaa Xaa

1

<210> 8

<211> 4

<212> PRT

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<223> Synthetic

<220>

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<223> Xaa = Any amino acid

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<222> (2)..(2)

<223> Xaa = Met, Tyr, Phe, Ile, Leu, His, or Lys

<220>

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<222> (3)..(3)

<223> Xaa = Ala, His, Met, Thr, Phe, or Gln

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<221> MISC\_FEATURE

<222> (4)..(4)

<223> Xaa = Ser, Ala, Gly, or Thr

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<221> MISC\_FEATURE

<222> (5)..(5)

<223> Xaa = phosphorylated Ser or phosphorylated Thr

<220>

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<222> (6)..(6)

<223> Xaa = Pro, Met, or Asn

<220>

<221> MISC\_FEATURE

<222> (7)..(7)

<223> Xaa = any amino acid

<400> 8

Xaa Xaa Xaa Xaa

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<220>  
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 <222> (4)..(4)  
 <223> PHOSPHORYLATION

<220>  
 <221> MOD\_RES  
 <222> (7)..(7)  
 <223> PHOSPHORYLATION

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Met Gln Ser Thr Pro Leu Ser  
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<210> 10  
 <211> 9  
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<220>  
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Tyr Asp Ile Xaa Gln Val Phe Pro Phe  
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 <212> DNA  
 <213> Homo sapiens

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 tggaactacg agtgcgcaga catgggccag agcgcatttc ccctgccccca ggcaaattcg 180

|             |             |            |            |             |            |      |
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| ggctggatgg  | gaattgtagt  | ctccctaaag | agttgtacgt | atctttttta  | ggcctagttt | 300  |
| ctgctttcaa  | aatacgaaaa  | cataacaaca | ctccagtcca | taactgttga  | caagtacaag | 360  |
| cgcgcacagg  | tctccaatct  | atccactgga | tttccgtgag | aattgtgccc  | gctctggtat | 420  |
| tggatgttcc  | tctccataag  | actacagttt | ctaaggaaca | ctgtggcgaa  | gacctttcat | 480  |
| tccgcaacgc  | atgctggaaa  | taattatttc | cctccacccc | cccaacaatc  | cttattactt | 540  |
| atattttaccg | aaactggaga  | cctccattag | ggcggaaaga | gtgggggatt  | gggacctctt | 600  |
| cttacgactg  | ctttggacaa  | taggtagcga | ttctgacctt | cgtacagcaa  | ttactgtgat | 660  |
| gcaataagcc  | gcaactggaa  | gagtagaggc | tagagggcag | gcactttatg  | gcaaactcag | 720  |
| gtagaattct  | tcctcttccg  | tctctttcct | tttacgtcat | ccggggggcag | actgggtggc | 780  |
| caatccagag  | ccccgagaga  | cgcttggtct | tttctgtccc | tcccatcctc  | tgattgtacc | 840  |
| ttgatttcgt  | attctgagag  | gctgctgctt | agcggtagcc | ccttggtttc  | cgtggcaacg | 900  |
| gaaaagcgcg  | ggaattacag  | ataaattaaa | actgcgactg | cgcggcgtga  | gctcgctgag | 960  |
| acttcctgga  | cgggggacag  | gctgtggggt | ttctcagata | actgggcccc  | tgcgctcagg | 1020 |
| aggccttcac  | cctctgctct  | gggtaaaggt | agtagagtcc | cgggaaaggg  | acagggggcc | 1080 |
| caagtgatgc  | tctggggtac  | tggcgtggga | gagtggattt | ccgaagctga  | cagatgggta | 1140 |
| ttctttgacg  | gggggtaggg  | gcggaacctg | agaggcgtaa | ggcgttgtga  | accctgggga | 1200 |
| ggggggcagt  | ttgtaggtcg  | cgagggaagc | gctgaggatc | aggaaggggg  | cactgagtgt | 1260 |
| ccgtggggga  | atcctcgtga  | taggaactgg | aatatgcctt | gagggggaca  | ctatgtcttt | 1320 |
| aaaaacgtcg  | gctgggtcatg | aggtcaggag | ttccagacca | gcctgaccaa  | cgtggtgaaa | 1380 |
| ctccgtctct  | actaaaaata  | caaaaattag | ccgggcgtgg | tgccgctcca  | gctactcagg | 1440 |
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| cgccattgca  | ctccagcctg  | ggcgacagag | cgagactgtc | tcaaaacaaa  | acaaaacaaa | 1560 |
| acaaaacaaa  | aaacaccggc  | tggtatgtat | gagaggatgg | gaccttgtgg  | aagaagaggt | 1620 |
| gccaggaata  | tgtctgggaa  | ggggaggaga | caggattttg | tgggaggggag | aacttaagaa | 1680 |
| ctggatccat  | ttgcgccatt  | gagaaagcgc | aagagggaag | tagaggagcg  | tcagtagtaa | 1740 |
| cagatgctgc  | cggcagggat  | gtgcttgagg | aggatccaga | gatgagagca  | ggtcactggg | 1800 |
| aaagggttagg | ggcggggagg  | ccttgattgg | tgttggtttg | gtcgttggtg  | attttggttt | 1860 |
| tatgcaagaa  | aaagaaaaca  | accagaaaca | ttggagaaag | ctaaggctac  | caccacctac | 1920 |

|            |             |             |            |            |             |      |
|------------|-------------|-------------|------------|------------|-------------|------|
| ccggtcagtc | actcctctgt  | agctttctct  | ttcttggaga | aaggaaaaga | cccaaggggt  | 1980 |
| tggcagcaat | atgtgaaaaa  | attcagaatt  | tatgttgtct | aattacaaaa | agcaacttct  | 2040 |
| agaatcttta | aaaataaagg  | acgttgtcat  | tagttctttg | gtttgtatta | ttctaaaacc  | 2100 |
| ttccaaatct | taaatttact  | ttattttaaa  | atgataaaat | gaagttgtca | ttttataaac  | 2160 |
| cttttaaaaa | gatatatata  | tatgtttttc  | taatgtgtta | aagttcattg | gaacagaaag  | 2220 |
| aaatggatth | atctgctctt  | cgcgttgaag  | aagtacaaaa | tgtcattaat | gctatgcaga  | 2280 |
| aaatcttaga | gtgtcccatc  | tggttaagtca | gcacaagagt | gtattaatth | gggattccta  | 2340 |
| tgattatctc | ctatgcaaat  | gaacagaatt  | gaccttacat | actagggag  | aaaagacatg  | 2400 |
| tctagtaaga | ttaggctatt  | gtaattgctg  | atthttctta | ctgaagaact | ttaaaaatat  | 2460 |
| agaaaatgat | tccttgttct  | ccatccactc  | tgcctctccc | actcctctcc | ttttcaacac  | 2520 |
| aaatcctgtg | gtccgggaaa  | gacagggact  | ctgtcttgat | tggttctgca | ctggggcagg  | 2580 |
| aatctagtht | agattaactg  | gcattttggc  | ttttcttcca | gctctaaaac | aagctccatc  | 2640 |
| acttgaaatg | gcaaaataaa  | atcatggatg  | agggcgaggg | cggtggctta | tgcctgtaat  | 2700 |
| cccagcactt | tgggaggcca  | aggtggtagg  | atcacgaggt | caggagatcg | agaccatcct  | 2760 |
| ggccaacatg | gtgaaacccc  | ctctccacta  | aaaatacaaa | aattagctgg | gcgtagtggc  | 2820 |
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| gcagatgttg | ctgtgagcca  | atatggcacc  | actgaactcc | agcgacagag | ctaaactcca  | 2940 |
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<213> Homo sapiens

<400> 12

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Asp | Leu | Ser | Ala | Leu | Arg | Val | Glu | Glu | Val | Gln | Asn | Val | Ile | Asn |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Met | Gln | Lys | Ile | Leu | Glu | Cys | Pro | Ile | Cys | Leu | Glu | Leu | Ile | Lys |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Pro | Val | Ser | Thr | Lys | Cys | Asp | His | Ile | Phe | Cys | Lys | Phe | Cys | Met |
|     |     |     | 35  |     |     |     | 40  |     |     |     |     | 45  |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Lys | Leu | Leu | Asn | Gln | Lys | Lys | Gly | Pro | Ser | Gln | Cys | Pro | Leu | Cys |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Lys | Asn | Asp | Ile | Thr | Lys | Arg | Ser | Leu | Gln | Glu | Ser | Thr | Arg | Phe | Ser |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     | 80  |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gln | Leu | Val | Glu | Glu | Leu | Leu | Lys | Ile | Ile | Cys | Ala | Phe | Gln | Leu | Asp |
|     |     |     | 85  |     |     |     |     | 90  |     |     |     |     |     | 95  |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Gly | Leu | Glu | Tyr | Ala | Asn | Ser | Tyr | Asn | Phe | Ala | Lys | Lys | Glu | Asn |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |

Asn Ser Pro Glu His Leu Lys Asp Glu Val Ser Ile Ile Gln Ser Met  
 115 120 125

Gly Tyr Arg Asn Arg Ala Lys Arg Leu Leu Gln Ser Glu Pro Glu Asn  
 130 135 140

Pro Ser Leu Gln Glu Thr Ser Leu Ser Val Gln Leu Ser Asn Leu Gly  
 145 150 155 160

Thr Val Arg Thr Leu Arg Thr Lys Gln Arg Ile Gln Pro Gln Lys Thr  
 165 170 175

Ser Val Tyr Ile Glu Leu Gly Ser Asp Ser Ser Glu Asp Thr Val Asn  
 180 185 190

Lys Ala Thr Tyr Cys Ser Val Gly Asp Gln Glu Leu Leu Gln Ile Thr  
 195 200 205

Pro Gln Gly Thr Arg Asp Glu Ile Ser Leu Asp Ser Ala Lys Lys Ala  
 210 215 220

Ala Cys Glu Phe Ser Glu Thr Asp Val Thr Asn Thr Glu His His Gln  
 225 230 235 240

Pro Ser Asn Asn Asp Leu Asn Thr Thr Glu Lys Arg Ala Ala Glu Arg  
 245 250 255

His Pro Glu Lys Tyr Gln Gly Ser Ser Val Ser Asn Leu His Val Glu  
 260 265 270

Pro Cys Gly Thr Asn Thr His Ala Ser Ser Leu Gln His Glu Asn Ser  
 275 280 285

Ser Leu Leu Leu Thr Lys Asp Arg Met Asn Val Glu Lys Ala Glu Phe  
 290 295 300

Cys Asn Lys Ser Lys Gln Pro Gly Leu Ala Arg Ser Gln His Asn Arg  
 305 310 315 320

Trp Ala Gly Ser Lys Glu Thr Cys Asn Asp Arg Arg Thr Pro Ser Thr  
 325 330 335

Glu Lys Lys Val Asp Leu Asn Ala Asp Pro Leu Cys Glu Arg Lys Glu  
 340 345 350

Trp Asn Lys Gln Lys Leu Pro Cys Ser Glu Asn Pro Arg Asp Thr Glu  
 355 360 365

Asp Val Pro Trp Ile Thr Leu Asn Ser Ser Ile Gln Lys Val Asn Glu  
 370 375 380

Trp Phe Ser Arg Ser Asp Glu Leu Leu Gly Ser Asp Asp Ser His Asp  
 385 390 395 400

Gly Glu Ser Glu Ser Asn Ala Lys Val Ala Asp Val Leu Asp Val Leu  
 405 410 415

Asn Glu Val Asp Glu Tyr Ser Gly Ser Ser Glu Lys Ile Asp Leu Leu  
 420 425 430

Ala Ser Asp Pro His Glu Ala Leu Ile Cys Lys Ser Glu Arg Val His  
 435 440 445

Ser Lys Ser Val Glu Ser Asn Ile Glu Asp Lys Ile Phe Gly Lys Thr  
 450 455 460

Tyr Arg Lys Lys Ala Ser Leu Pro Asn Leu Ser His Val Thr Glu Asn  
 465 470 475 480

Leu Ile Ile Gly Ala Phe Val Thr Glu Pro Gln Ile Ile Gln Glu Arg  
 485 490 495

Pro Leu Thr Asn Lys Leu Lys Arg Lys Arg Arg Pro Thr Ser Gly Leu  
 500 505 510

His Pro Glu Asp Phe Ile Lys Lys Ala Asp Leu Ala Val Gln Lys Thr  
 515 520 525

Pro Glu Met Ile Asn Gln Gly Thr Asn Gln Thr Glu Gln Asn Gly Gln  
 530 535 540

Val Met Asn Ile Thr Asn Ser Gly His Glu Asn Lys Thr Lys Gly Asp  
 545 550 555 560

Ser Ile Gln Asn Glu Lys Asn Pro Asn Pro Ile Glu Ser Leu Glu Lys



| 565 |     |     |     |     | 570 |     |     |     |     | 575 |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Ser | Ala | Phe | Lys | Thr | Lys | Ala | Glu | Pro | Ile | Ser | Ser | Ser | Ile | Ser |
|     |     |     | 580 |     |     |     |     | 585 |     |     |     |     | 590 |     |     |
| Asn | Met | Glu | Leu | Glu | Leu | Asn | Ile | His | Asn | Ser | Lys | Ala | Pro | Lys | Lys |
|     |     | 595 |     |     |     |     | 600 |     |     |     |     | 605 |     |     |     |
| Asn | Arg | Leu | Arg | Arg | Lys | Ser | Ser | Thr | Arg | His | Ile | His | Ala | Leu | Glu |
|     | 610 |     |     |     |     | 615 |     |     |     |     | 620 |     |     |     |     |
| Leu | Val | Val | Ser | Arg | Asn | Leu | Ser | Pro | Pro | Asn | Cys | Thr | Glu | Leu | Gln |
| 625 |     |     |     |     |     | 630 |     |     |     |     | 635 |     |     |     | 640 |
| Ile | Asp | Ser | Cys | Ser | Ser | Ser | Glu | Glu | Ile | Lys | Lys | Lys | Lys | Tyr | Asn |
|     |     |     | 645 |     |     |     |     |     | 650 |     |     |     |     | 655 |     |
| Gln | Met | Pro | Val | Arg | His | Ser | Arg | Asn | Leu | Gln | Leu | Met | Glu | Gly | Lys |
|     |     | 660 |     |     |     |     |     | 665 |     |     |     |     | 670 |     |     |
| Glu | Pro | Ala | Thr | Gly | Ala | Lys | Lys | Ser | Asn | Lys | Pro | Asn | Glu | Gln | Thr |
|     |     | 675 |     |     |     |     | 680 |     |     |     |     | 685 |     |     |     |
| Ser | Lys | Arg | His | Asp | Ser | Asp | Thr | Phe | Pro | Glu | Leu | Lys | Leu | Thr | Asn |
|     | 690 |     |     |     |     | 695 |     |     |     |     | 700 |     |     |     |     |
| Ala | Pro | Gly | Ser | Phe | Thr | Lys | Cys | Ser | Asn | Thr | Ser | Glu | Leu | Lys | Glu |
| 705 |     |     |     |     |     | 710 |     |     |     |     | 715 |     |     |     | 720 |
| Phe | Val | Asn | Pro | Ser | Leu | Pro | Arg | Glu | Glu | Lys | Glu | Glu | Lys | Leu | Glu |
|     |     |     | 725 |     |     |     |     | 730 |     |     |     |     |     | 735 |     |
| Thr | Val | Lys | Val | Ser | Asn | Asn | Ala | Glu | Asp | Pro | Lys | Asp | Leu | Met | Leu |
|     |     |     | 740 |     |     |     |     | 745 |     |     |     |     | 750 |     |     |
| Ser | Gly | Glu | Arg | Val | Leu | Gln | Thr | Glu | Arg | Ser | Val | Glu | Ser | Ser | Ser |
|     |     | 755 |     |     |     |     | 760 |     |     |     |     | 765 |     |     |     |
| Ile | Ser | Leu | Val | Pro | Gly | Thr | Asp | Tyr | Gly | Thr | Gln | Glu | Ser | Ile | Ser |
|     | 770 |     |     |     |     | 775 |     |     |     |     | 780 |     |     |     |     |
| Leu | Leu | Glu | Val | Ser | Thr | Leu | Gly | Lys | Ala | Lys | Thr | Glu | Pro | Asn | Lys |
| 785 |     |     |     |     |     | 790 |     |     |     |     | 795 |     |     |     | 800 |

Cys Val Ser Gln Cys Ala Ala Phe Glu Asn Pro Lys Gly Leu Ile His  
805 810 815

Gly Cys Ser Lys Asp Asn Arg Asn Asp Thr Glu Gly Phe Lys Tyr Pro  
820 825 830

Leu Gly His Glu Val Asn His Ser Arg Glu Thr Ser Ile Glu Met Glu  
835 840 845

Glu Ser Glu Leu Asp Ala Gln Tyr Leu Gln Asn Thr Phe Lys Val Ser  
850 855 860

Lys Arg Gln Ser Phe Ala Pro Phe Ser Asn Pro Gly Asn Ala Glu Glu  
865 870 875 880

Glu Cys Ala Thr Phe Ser Ala His Ser Gly Ser Leu Lys Lys Gln Ser  
885 890 895

Pro Lys Val Thr Phe Glu Cys Glu Gln Lys Glu Glu Asn Gln Gly Lys  
900 905 910

Asn Glu Ser Asn Ile Lys Pro Val Gln Thr Val Asn Ile Thr Ala Gly  
915 920 925

Phe Pro Val Val Gly Gln Lys Asp Lys Pro Val Asp Asn Ala Lys Cys  
930 935 940

Ser Ile Lys Gly Gly Ser Arg Phe Cys Leu Ser Ser Gln Phe Arg Gly  
945 950 955 960

Asn Glu Thr Gly Leu Ile Thr Pro Asn Lys His Gly Leu Leu Gln Asn  
965 970 975

Pro Tyr Arg Ile Pro Pro Leu Phe Pro Ile Lys Ser Phe Val Lys Thr  
980 985 990

Lys Cys Lys Lys Asn Leu Leu Glu Glu Asn Phe Glu Glu His Ser Met  
995 1000 1005

Ser Pro Glu Arg Glu Met Gly Asn Glu Asn Ile Pro Ser Thr Val  
1010 1015 1020

|      |     |     |     |     |     |      |     |     |     |     |      |     |     |     |
|------|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|
| Ser  | Thr | Ile | Ser | Arg | Asn | Asn  | Ile | Arg | Glu | Asn | Val  | Phe | Lys | Glu |
| 1025 |     |     |     |     |     | 1030 |     |     |     |     | 1035 |     |     |     |
| Ala  | Ser | Ser | Ser | Asn | Ile | Asn  | Glu | Val | Gly | Ser | Ser  | Thr | Asn | Glu |
| 1040 |     |     |     |     |     | 1045 |     |     |     |     | 1050 |     |     |     |
| Val  | Gly | Ser | Ser | Ile | Asn | Glu  | Ile | Gly | Ser | Ser | Asp  | Glu | Asn | Ile |
| 1055 |     |     |     |     |     | 1060 |     |     |     |     | 1065 |     |     |     |
| Gln  | Ala | Glu | Leu | Gly | Arg | Asn  | Arg | Gly | Pro | Lys | Leu  | Asn | Ala | Met |
| 1070 |     |     |     |     |     | 1075 |     |     |     |     | 1080 |     |     |     |
| Leu  | Arg | Leu | Gly | Val | Leu | Gln  | Pro | Glu | Val | Tyr | Lys  | Gln | Ser | Leu |
| 1085 |     |     |     |     |     | 1090 |     |     |     |     | 1095 |     |     |     |
| Pro  | Gly | Ser | Asn | Cys | Lys | His  | Pro | Glu | Ile | Lys | Lys  | Gln | Glu | Tyr |
| 1100 |     |     |     |     |     | 1105 |     |     |     |     | 1110 |     |     |     |
| Glu  | Glu | Val | Val | Gln | Thr | Val  | Asn | Thr | Asp | Phe | Ser  | Pro | Tyr | Leu |
| 1115 |     |     |     |     |     | 1120 |     |     |     |     | 1125 |     |     |     |
| Ile  | Ser | Asp | Asn | Leu | Glu | Gln  | Pro | Met | Gly | Ser | Ser  | His | Ala | Ser |
| 1130 |     |     |     |     |     | 1135 |     |     |     |     | 1140 |     |     |     |
| Gln  | Val | Cys | Ser | Glu | Thr | Pro  | Asp | Asp | Leu | Leu | Asp  | Asp | Gly | Glu |
| 1145 |     |     |     |     |     | 1150 |     |     |     |     | 1155 |     |     |     |
| Ile  | Lys | Glu | Asp | Thr | Ser | Phe  | Ala | Glu | Asn | Asp | Ile  | Lys | Glu | Ser |
| 1160 |     |     |     |     |     | 1165 |     |     |     |     | 1170 |     |     |     |
| Ser  | Ala | Val | Phe | Ser | Lys | Ser  | Val | Gln | Lys | Gly | Glu  | Leu | Ser | Arg |
| 1175 |     |     |     |     |     | 1180 |     |     |     |     | 1185 |     |     |     |
| Ser  | Pro | Ser | Pro | Phe | Thr | His  | Thr | His | Leu | Ala | Gln  | Gly | Tyr | Arg |
| 1190 |     |     |     |     |     | 1195 |     |     |     |     | 1200 |     |     |     |
| Arg  | Gly | Ala | Lys | Lys | Leu | Glu  | Ser | Ser | Glu | Glu | Asn  | Leu | Ser | Ser |
| 1205 |     |     |     |     |     | 1210 |     |     |     |     | 1215 |     |     |     |
| Glu  | Asp | Glu | Glu | Leu | Pro | Cys  | Phe | Gln | His | Leu | Leu  | Phe | Gly | Lys |
| 1220 |     |     |     |     |     | 1225 |     |     |     |     | 1230 |     |     |     |

|      |     |     |     |     |     |      |     |     |     |     |      |     |     |     |
|------|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|
| Val  | Asn | Asn | Ile | Pro | Ser | Gln  | Ser | Thr | Arg | His | Ser  | Thr | Val | Ala |
| 1235 |     |     |     |     |     | 1240 |     |     |     |     | 1245 |     |     |     |
| Thr  | Glu | Cys | Leu | Ser | Lys | Asn  | Thr | Glu | Glu | Asn | Leu  | Leu | Ser | Leu |
| 1250 |     |     |     |     |     | 1255 |     |     |     |     | 1260 |     |     |     |
| Lys  | Asn | Ser | Leu | Asn | Asp | Cys  | Ser | Asn | Gln | Val | Ile  | Leu | Ala | Lys |
| 1265 |     |     |     |     |     | 1270 |     |     |     |     | 1275 |     |     |     |
| Ala  | Ser | Gln | Glu | His | His | Leu  | Ser | Glu | Glu | Thr | Lys  | Cys | Ser | Ala |
| 1280 |     |     |     |     |     | 1285 |     |     |     |     | 1290 |     |     |     |
| Ser  | Leu | Phe | Ser | Ser | Gln | Cys  | Ser | Glu | Leu | Glu | Asp  | Leu | Thr | Ala |
| 1295 |     |     |     |     |     | 1300 |     |     |     |     | 1305 |     |     |     |
| Asn  | Thr | Asn | Thr | Gln | Asp | Pro  | Phe | Leu | Ile | Gly | Ser  | Ser | Lys | Gln |
| 1310 |     |     |     |     |     | 1315 |     |     |     |     | 1320 |     |     |     |
| Met  | Arg | His | Gln | Ser | Glu | Ser  | Gln | Gly | Val | Gly | Leu  | Ser | Asp | Lys |
| 1325 |     |     |     |     |     | 1330 |     |     |     |     | 1335 |     |     |     |
| Glu  | Leu | Val | Ser | Asp | Asp | Glu  | Glu | Arg | Gly | Thr | Gly  | Leu | Glu | Glu |
| 1340 |     |     |     |     |     | 1345 |     |     |     |     | 1350 |     |     |     |
| Asn  | Asn | Gln | Glu | Glu | Gln | Ser  | Met | Asp | Ser | Asn | Leu  | Gly | Glu | Ala |
| 1355 |     |     |     |     |     | 1360 |     |     |     |     | 1365 |     |     |     |
| Ala  | Ser | Gly | Cys | Glu | Ser | Glu  | Thr | Ser | Val | Ser | Glu  | Asp | Cys | Ser |
| 1370 |     |     |     |     |     | 1375 |     |     |     |     | 1380 |     |     |     |
| Gly  | Leu | Ser | Ser | Gln | Ser | Asp  | Ile | Leu | Thr | Thr | Gln  | Gln | Arg | Asp |
| 1385 |     |     |     |     |     | 1390 |     |     |     |     | 1395 |     |     |     |
| Thr  | Met | Gln | His | Asn | Leu | Ile  | Lys | Leu | Gln | Gln | Glu  | Met | Ala | Glu |
| 1400 |     |     |     |     |     | 1405 |     |     |     |     | 1410 |     |     |     |
| Leu  | Glu | Ala | Val | Leu | Glu | Gln  | His | Gly | Ser | Gln | Pro  | Ser | Asn | Ser |
| 1415 |     |     |     |     |     | 1420 |     |     |     |     | 1425 |     |     |     |
| Tyr  | Pro | Ser | Ile | Ile | Ser | Asp  | Ser | Ser | Ala | Leu | Glu  | Asp | Leu | Arg |
| 1430 |     |     |     |     |     | 1435 |     |     |     |     | 1440 |     |     |     |
| Asn  | Pro | Glu | Gln | Ser | Thr | Ser  | Glu | Lys | Ala | Val | Leu  | Thr | Ser | Gln |

|                             |                                 |      |  |      |
|-----------------------------|---------------------------------|------|--|------|
| 1445                        |                                 | 1450 |  | 1455 |
| Lys Ser Ser Glu Tyr Pro Ile | Ser Gln Asn Pro Glu Gly Leu Ser |      |  |      |
| 1460                        | 1465                            | 1470 |  |      |
| Ala Asp Lys Phe Glu Val Ser | Ala Asp Ser Ser Thr Ser Lys Asn |      |  |      |
| 1475                        | 1480                            | 1485 |  |      |
| Lys Glu Pro Gly Val Glu Arg | Ser Ser Pro Ser Lys Cys Pro Ser |      |  |      |
| 1490                        | 1495                            | 1500 |  |      |
| Leu Asp Asp Arg Trp Tyr Met | His Ser Cys Ser Gly Ser Leu Gln |      |  |      |
| 1505                        | 1510                            | 1515 |  |      |
| Asn Arg Asn Tyr Pro Ser Gln | Glu Glu Leu Ile Lys Val Val Asp |      |  |      |
| 1520                        | 1525                            | 1530 |  |      |
| Val Glu Glu Gln Gln Leu Glu | Glu Ser Gly Pro His Asp Leu Thr |      |  |      |
| 1535                        | 1540                            | 1545 |  |      |
| Glu Thr Ser Tyr Leu Pro Arg | Gln Asp Leu Glu Gly Thr Pro Tyr |      |  |      |
| 1550                        | 1555                            | 1560 |  |      |
| Leu Glu Ser Gly Ile Ser Leu | Phe Ser Asp Asp Pro Glu Ser Asp |      |  |      |
| 1565                        | 1570                            | 1575 |  |      |
| Pro Ser Glu Asp Arg Ala Pro | Glu Ser Ala Arg Val Gly Asn Ile |      |  |      |
| 1580                        | 1585                            | 1590 |  |      |
| Pro Ser Ser Thr Ser Ala Leu | Lys Val Pro Gln Leu Lys Val Ala |      |  |      |
| 1595                        | 1600                            | 1605 |  |      |
| Glu Ser Ala Gln Ser Pro Ala | Ala Ala His Thr Thr Asp Thr Ala |      |  |      |
| 1610                        | 1615                            | 1620 |  |      |
| Gly Tyr Asn Ala Met Glu Glu | Ser Val Ser Arg Glu Lys Pro Glu |      |  |      |
| 1625                        | 1630                            | 1635 |  |      |
| Leu Thr Ala Ser Thr Glu Arg | Val Asn Lys Arg Met Ser Met Val |      |  |      |
| 1640                        | 1645                            | 1650 |  |      |
| Val Ser Gly Leu Thr Pro Glu | Glu Phe Met Leu Val Tyr Lys Phe |      |  |      |
| 1655                        | 1660                            | 1665 |  |      |

|         |                     |                     |             |
|---------|---------------------|---------------------|-------------|
| Ala Arg | Lys His His Ile Thr | Leu Thr Asn Leu Ile | Thr Glu Glu |
| 1670    | 1675                | 1680                |             |
| Thr Thr | His Val Val Met Lys | Thr Asp Ala Glu Phe | Val Cys Glu |
| 1685    | 1690                | 1695                |             |
| Arg Thr | Leu Lys Tyr Phe Leu | Gly Ile Ala Gly Gly | Lys Trp Val |
| 1700    | 1705                | 1710                |             |
| Val Ser | Tyr Phe Trp Val Thr | Gln Ser Ile Lys Glu | Arg Lys Met |
| 1715    | 1720                | 1725                |             |
| Leu Asn | Glu His Asp Phe Glu | Val Arg Gly Asp Val | Val Asn Gly |
| 1730    | 1735                | 1740                |             |
| Arg Asn | His Gln Gly Pro Lys | Arg Ala Arg Glu Ser | Gln Asp Arg |
| 1745    | 1750                | 1755                |             |
| Lys Ile | Phe Arg Gly Leu Glu | Ile Cys Cys Tyr Gly | Pro Phe Thr |
| 1760    | 1765                | 1770                |             |
| Asn Met | Pro Thr Asp Gln Leu | Glu Trp Met Val Gln | Leu Cys Gly |
| 1775    | 1780                | 1785                |             |
| Ala Ser | Val Val Lys Glu Leu | Ser Ser Phe Thr Leu | Gly Thr Gly |
| 1790    | 1795                | 1800                |             |
| Val His | Pro Ile Val Val Val | Gln Pro Asp Ala Trp | Thr Glu Asp |
| 1805    | 1810                | 1815                |             |
| Asn Gly | Phe His Ala Ile Gly | Gln Met Cys Glu Ala | Pro Val Val |
| 1820    | 1825                | 1830                |             |
| Thr Arg | Glu Trp Val Leu Asp | Ser Val Ala Leu Tyr | Gln Cys Gln |
| 1835    | 1840                | 1845                |             |
| Glu Leu | Asp Thr Tyr Leu Ile | Pro Gln Ile Pro His | Ser His Tyr |
| 1850    | 1855                | 1860                |             |

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 <212> DNA

<213> Homo sapiens

<400> 13

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| acaggagaga | aatttaaact  | ggacccccggc | cgaagtccca | cagttagctg | cagcaaaacg | 120  |
| caggctgcct | cagggaaagg  | agcctggggt  | gattaacttg | tgtgccaatg | tcccaccctg | 180  |
| cccaggtaac | atTTTgcccc  | ctgagggtccg | gggtaattta | atggctgctg | gacaaaacct | 240  |
| ccaaagttct | gaaagatcag  | aaatgatagc  | tacctggagt | ccagctgtac | ggacactgag | 300  |
| gaatattact | aataatgctg  | acattcagca  | gatgaaccgg | ccatcaaagt | tagcacatat | 360  |
| cttacagact | ctttcagcac  | ctacgaaaaa  | tttagaacag | caggtgaatc | acagccagca | 420  |
| gggacataca | aatgccaatg  | cagtgtctgt  | tagccaagtg | aaagtgactc | cagagacaca | 480  |
| catgctacag | cagcagcagc  | aggcccagca  | gcagcagcag | cagcaccctg | ttttacacct | 540  |
| tcagccccag | cagataatgc  | agctccagca  | gcagcagcag | cagcagatct | ctcagcaacc | 600  |
| ttacccccag | cagccgcccgc | atccatTTTc  | acagcaacag | cagcagcagc | agcaagccca | 660  |
| tccgcatcag | ttttcacagc  | aacagctaca  | gtttccacag | caacagttgc | atcctccaca | 720  |
| gcagctgcat | cgccttcagc  | agcagctcca  | gccctttcag | cagcagcatg | ccctgcagca | 780  |
| gcagttccat | cagctgcagc  | agcaccagct  | ccagcagcag | cagctcgccc | agctccagca | 840  |
| gcagcacagc | ctgctccagc  | agcagcagca  | acagcagatt | cagcagcagc | agctccagcg | 900  |
| catgcaccag | cagcagcagc  | agcagcagat  | gcaaagtcag | acagcgccac | acttgagtca | 960  |
| gacgtcacag | gcgctgcagc  | atcaggttcc  | acctcagcag | ccccgcagc  | agcagcagca | 1020 |
| acagcagcca | ccaccatcgc  | ctcagcagca  | tcagctTTTT | ggacatgatc | cagcagtggg | 1080 |
| gattccagaa | gaaggcttct  | tattgggatg  | tgtgtttgca | attgcggatt | atccagagca | 1140 |
| gatgtctgat | aagcaactgc  | tggccacctg  | gaaaaggata | atccaggcac | atggcggcac | 1200 |
| tgttgacccc | accttcacga  | gtcgatgcac  | gcaccttctc | tgtgagagtc | aagtcagcag | 1260 |
| cgcgtatgca | caggcaataa  | gagaaagaaa  | gagatgtgtt | actgcacact | ggttaaacac | 1320 |
| agtcttaaag | aagaagaaaa  | tgggtaccgc  | gcaccgagcc | cttcacttcc | cagtggcctt | 1380 |
| cccaccagga | ggaaagccat  | gttcacagca  | tattatttct | gtgactggat | ttgttgatag | 1440 |
| tgacagagat | gacctaaaat  | taatggctta  | tttggcaggt | gccaaatata | cgggttatct | 1500 |
| atgccgcagc | aacacagtcc  | tcattctgtg  | agaaccaact | ggtttaaagt | atgaaaaagc | 1560 |
| caaagagtgg | aggataccct  | gtgtcaacgc  | ccagtggcct | ggcgacattc | ttctgggaaa | 1620 |

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ctttgaggca ctgaggcaga ttcagtatag tcgctacacg gcattcagtc tgcaggatcc 1680
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tcaacagtat attaagaagc tctacattct tgggtggagag gttgcggagt ctgcacagaa 1980
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ccttgctatc tctaaattat ggatgttaaa gatttgaaat gttttgtact ttgattattt 2880
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acttttgaac ttaaaaaaaaa aaaaaaaaaa 2969

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<212> PRT
<213> Homo sapiens

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<400> 14

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Met Ser Asp Gln Ala Pro Lys Val Pro Glu Glu Met Phe Arg Glu Val
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Lys Tyr Tyr Ala Val Gly Asp Ile Asp Pro Gln Val Ile Gln Leu Leu  
 20 25 30

Lys Ala Gly Lys Ala Lys Glu Val Ser Tyr Asn Ala Leu Ala Ser His  
 35 40 45

Ile Ile Ser Glu Asp Gly Asp Asn Pro Glu Val Gly Glu Ala Arg Glu  
 50 55 60

Val Phe Asp Leu Pro Val Val Lys Pro Ser Trp Val Ile Leu Ser Val  
 65 70 75 80

Gln Cys Gly Thr Leu Leu Pro Val Asn Gly Phe Ser Pro Glu Ser Cys  
 85 90 95

Gln Ile Phe Phe Gly Ile Thr Ala Cys Leu Ser Gln Val Ser Ser Glu  
 100 105 110

Asp Arg Ser Ala Leu Trp Ala Leu Val Thr Phe Tyr Gly Gly Asp Cys  
 115 120 125

Gln Leu Thr Leu Asn Lys Lys Cys Thr His Leu Ile Val Pro Glu Pro  
 130 135 140

Lys Gly Glu Lys Tyr Glu Cys Ala Leu Lys Arg Ala Ser Ile Lys Ile  
 145 150 155 160

Val Thr Pro Asp Trp Val Leu Asp Cys Val Ser Glu Lys Thr Lys Lys  
 165 170 175

Asp Glu Ala Phe Tyr His Pro Arg Leu Ile Ile Tyr Glu Glu Glu Glu  
 180 185 190

Glu Glu Glu Glu Glu Glu Glu Val Glu Asn Glu Glu Gln Asp Ser  
 195 200 205

Gln Asn Glu Gly Ser Thr Asp Glu Lys Ser Ser Pro Ala Ser Ser Gln  
 210 215 220

Glu Gly Ser Pro Ser Gly Asp Gln Gln Phe Ser Pro Lys Ser Asn Thr  
 225 230 235 240

Glu Lys Ser Lys Gly Glu Leu Met Phe Asp Asp Ser Ser Asp Ser Ser  
 245 250 255  
 Pro Glu Lys Gln Glu Arg Asn Leu Asn Trp Thr Pro Ala Glu Val Pro  
 260 265 270  
 Gln Leu Ala Ala Ala Lys Arg Arg Leu Pro Gln Gly Lys Glu Pro Gly  
 275 280 285  
 Leu Ile Asn Leu Cys Ala Asn Val Pro Pro Val Pro Gly Asn Ile Leu  
 290 295 300  
 Pro Pro Glu Val Arg Gly Asn Leu Met Ala Ala Gly Gln Asn Leu Gln  
 305 310 315 320  
 Ser Ser Glu Arg Ser Glu Met Ile Ala Thr Trp Ser Pro Ala Val Arg  
 325 330 335  
 Thr Leu Arg Asn Ile Thr Asn Asn Ala Asp Ile Gln Gln Met Asn Arg  
 340 345 350  
 Pro Ser Asn Val Ala His Ile Leu Gln Thr Leu Ser Ala Pro Thr Lys  
 355 360 365  
 Asn Leu Glu Gln Gln Val Asn His Ser Gln Gln Gly His Thr Asn Ala  
 370 375 380  
 Asn Ala Val Leu Phe Ser Gln Val Lys Val Thr Pro Glu Thr His Met  
 385 390 395 400  
 Leu Gln Gln Gln Gln Gln Ala Gln Gln Gln Gln Gln Gln His Pro Val  
 405 410 415  
 Leu His Leu Gln Pro Gln Gln Ile Met Gln Leu Gln Gln Gln Gln Gln  
 420 425 430  
 Gln Gln Ile Ser Gln Gln Pro Tyr Pro Gln Gln Pro Pro His Pro Phe  
 435 440 445  
 Ser Gln Gln Gln Gln Gln Gln Gln Gln Ala His Pro His Gln Phe Ser  
 450 455 460  
 Gln Gln Gln Leu Gln Phe Pro Gln Gln Gln Leu His Pro Pro Gln Gln

|   |     |     |     |     |     |     |
|---|-----|-----|-----|-----|-----|-----|
| 465   |     | 470 |     | 475 |     | 480 |
| Leu His Arg Pro Gln Gln Gln Leu Gln Pro Phe Gln Gln Gln His Ala |     |     |     |     |     |     |
|   | 485 |     | 490 |     | 495 |     |
| Leu Gln Gln Gln Phe His Gln Leu Gln Gln His Gln Leu Gln Gln Gln |     |     |     |     |     |     |
|   | 500 |     | 505 |     | 510 |     |
| Gln Leu Ala Gln Leu Gln Gln Gln His Ser Leu Leu Gln Gln Gln Gln |     |     |     |     |     |     |
|   | 515 |     | 520 |     | 525 |     |
| Gln Gln Gln Ile Gln Gln Gln Gln Leu Gln Arg Met His Gln Gln Gln |     |     |     |     |     |     |
|   | 530 |     | 535 |     | 540 |     |
| Gln Gln Gln Gln Met Gln Ser Gln Thr Ala Pro His Leu Ser Gln Thr |     |     |     |     |     |     |
| 545   |     | 550 |     | 555 |     | 560 |
| Ser Gln Ala Leu Gln His Gln Val Pro Pro Gln Gln Pro Pro Gln Gln |     |     |     |     |     |     |
|   | 565 |     | 570 |     | 575 |     |
| Gln Gln Gln Gln Gln Pro Pro Pro Ser Pro Gln Gln His Gln Leu Phe |     |     |     |     |     |     |
|   | 580 |     | 585 |     | 590 |     |
| Gly His Asp Pro Ala Val Glu Ile Pro Glu Glu Gly Phe Leu Leu Gly |     |     |     |     |     |     |
|   | 595 |     | 600 |     | 605 |     |
| Cys Val Phe Ala Ile Ala Asp Tyr Pro Glu Gln Met Ser Asp Lys Gln |     |     |     |     |     |     |
|   | 610 |     | 615 |     | 620 |     |
| Leu Leu Ala Thr Trp Lys Arg Ile Ile Gln Ala His Gly Gly Thr Val |     |     |     |     |     |     |
| 625   |     | 630 |     | 635 |     | 640 |
| Asp Pro Thr Phe Thr Ser Arg Cys Thr His Leu Leu Cys Glu Ser Gln |     |     |     |     |     |     |
|   | 645 |     | 650 |     | 655 |     |
| Val Ser Ser Ala Tyr Ala Gln Ala Ile Arg Glu Arg Lys Arg Cys Val |     |     |     |     |     |     |
|   | 660 |     | 665 |     | 670 |     |
| Thr Ala His Trp Leu Asn Thr Val Leu Lys Lys Lys Lys Met Val Pro |     |     |     |     |     |     |
|   | 675 |     | 680 |     | 685 |     |
| Pro His Arg Ala Leu His Phe Pro Val Ala Phe Pro Pro Gly Gly Lys |     |     |     |     |     |     |
|   | 690 |     | 695 |     | 700 |     |

Pro Cys Ser Gln His Ile Ile Ser Val Thr Gly Phe Val Asp Ser Asp  
705 710 715 720

Arg Asp Asp Leu Lys Leu Met Ala Tyr Leu Ala Gly Ala Lys Tyr Thr  
725 730 735

Gly Tyr Leu Cys Arg Ser Asn Thr Val Leu Ile Cys Lys Glu Pro Thr  
740 745 750

Gly Leu Lys Tyr Glu Lys Ala Lys Glu Trp Arg Ile Pro Cys Val Asn  
755 760 765

Ala Gln Trp Leu Gly Asp Ile Leu Leu Gly Asn Phe Glu Ala Leu Arg  
770 775 780

Gln Ile Gln Tyr Ser Arg Tyr Thr Ala Phe Ser Leu Gln Asp Pro Phe  
785 790 795 800

Ala Pro Thr Gln His Leu Val Leu Asn Leu Leu Asp Ala Trp Arg Val  
805 810 815

Pro Leu Lys Val Ser Ala Glu Leu Leu Met Ser Ile Arg Leu Pro Pro  
820 825 830

Lys Leu Lys Gln Asn Glu Val Ala Asn Val Gln Pro Ser Ser Lys Arg  
835 840 845

Ala Arg Ile Glu Asp Val Pro Pro Pro Thr Lys Lys Leu Thr Pro Glu  
850 855 860

Leu Thr Pro Phe Val Leu Phe Thr Gly Phe Glu Pro Val Gln Val Gln  
865 870 875 880

Gln Tyr Ile Lys Lys Leu Tyr Ile Leu Gly Gly Glu Val Ala Glu Ser  
885 890 895

Ala Gln Lys Cys Thr His Leu Ile Ala Ser Lys Val Thr Arg Thr Val  
900 905 910

Lys Phe Leu Thr Ala Ile Ser Val Val Lys His Ile Val Thr Pro Glu  
915 920 925

Trp Leu Glu Glu Cys Phe Arg Cys Gln Lys Phe Ile Asp Glu Gln Asn  
 930 935 940

Tyr Ile Leu Arg Asp Ala Glu Ala Glu Val Leu Phe Ser Phe Ser Leu  
 945 950 955 960

Glu Glu Ser Leu Lys Arg Ala His Val Ser Pro Leu Phe Lys Ala Lys  
 965 970 975

Tyr Phe Tyr Ile Thr Pro Gly Ile Cys Pro Ser Leu Ser Thr Met Lys  
 980 985 990

Ala Ile Val Glu Cys Ala Gly Gly Lys Val Leu Ser Lys Gln Pro Ser  
 995 1000 1005

Phe Arg Lys Leu Met Glu His Lys Gln Asn Ser Ser Leu Ser Glu  
 1010 1015 1020

Ile Ile Leu Ile Ser Cys Glu Asn Asp Leu His Leu Cys Arg Glu  
 1025 1030 1035

Tyr Phe Ala Arg Gly Ile Asp Val His Asn Ala Glu Phe Val Leu  
 1040 1045 1050

Thr Gly Val Leu Thr Gln Thr Leu Asp Tyr Glu Ser Tyr Lys Phe  
 1055 1060 1065

Asn

<210> 15  
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 <212> PRT  
 <213> Homo sapiens

<400> 15

Met Ala Ala Gly Gln Asn Leu Gln Ser Ser Glu Arg Ser Glu Met Ile  
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Ala Thr Trp Ser Pro Ala Val Arg Thr Leu Arg Asn Ile Thr Asn Asn  
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Ala Asp Ile Gln Gln Met Asn Arg Pro Ser Asn Val Ala His Ile Leu

|   |     |     |
|---|-----|-----|
| 35  | 40  | 45  |
| Gln Thr Leu Ser Ala Pro Thr Lys Asn Leu Glu Gln Gln Val Asn His |     |     |
| 50  | 55  | 60  |
| Ser Gln Gln Gly His Thr Asn Ala Asn Ala Val Leu Phe Ser Gln Val |     |     |
| 65  | 70  | 75  |
| Lys Val Thr Pro Glu Thr His Met Leu Gln Gln Gln Gln Gln Ala Gln |     |     |
| 85  | 90  | 95  |
| Gln Gln Gln Gln Gln His Pro Val Leu His Leu Gln Pro Gln Gln Ile |     |     |
| 100   | 105 | 110 |
| Met Gln Leu Gln Gln Gln Gln Gln Gln Gln Ile Ser Gln Gln Pro Tyr |     |     |
| 115   | 120 | 125 |
| Pro Gln Gln Pro Pro His Pro Phe Ser Gln Gln Gln Gln Gln Gln Gln |     |     |
| 130   | 135 | 140 |
| Gln Ala His Pro His Gln Phe Ser Gln Gln Gln Leu Gln Phe Pro Gln |     |     |
| 145   | 150 | 155 |
| Gln Gln Leu His Pro Pro Gln Gln Leu His Arg Pro Gln Gln Gln Leu |     |     |
| 165   | 170 | 175 |
| Gln Pro Phe Gln Gln Gln His Ala Leu Gln Gln Gln Phe His Gln Leu |     |     |
| 180   | 185 | 190 |
| Gln Gln His Gln Leu Gln Gln Gln Gln Leu Ala Gln Leu Gln Gln Gln |     |     |
| 195   | 200 | 205 |
| His Ser Leu Leu Gln Gln Gln Gln Gln Gln Gln Ile Gln Gln Gln Gln |     |     |
| 210   | 215 | 220 |
| Leu Gln Arg Met His Gln Gln Gln Gln Gln Gln Gln Met Gln Ser Gln |     |     |
| 225   | 230 | 235 |
| Thr Ala Pro His Leu Ser Gln Thr Ser Gln Ala Leu Gln His Gln Val |     |     |
| 245   | 250 | 255 |
| Pro Pro Gln Gln Pro Pro Gln Gln Gln Gln Gln Gln Gln Pro Pro Pro |     |     |
| 260   | 265 | 270 |

Ser Pro Gln Gln His Gln Leu Phe Gly His Asp Pro Ala Val Glu Ile  
275 280 285

Pro Glu Glu Gly Phe Leu Leu Gly Cys Val Phe Ala Ile Ala Asp Tyr  
290 295 300

Pro Glu Gln Met Ser Asp Lys Gln Leu Leu Ala Thr Trp Lys Arg Ile  
305 310 315 320

Ile Gln Ala His Gly Gly Thr Val Asp Pro Thr Phe Thr Ser Arg Cys  
325 330 335

Thr His Leu Leu Cys Glu Ser Gln Val Ser Ser Ala Tyr Ala Gln Ala  
340 345 350

Ile Arg Glu Arg Lys Arg Cys Val Thr Ala His Trp Leu Asn Thr Val  
355 360 365

Leu Lys Lys Lys Lys Met Val Pro Pro His Arg Ala Leu His Phe Pro  
370 375 380

Val Ala Phe Pro Pro Gly Gly Lys Pro Cys Ser Gln His Ile Ile Ser  
385 390 395 400

Val Thr Gly Phe Val Asp Ser Asp Arg Asp Asp Leu Lys Leu Met Ala  
405 410 415

Tyr Leu Ala Gly Ala Lys Tyr Thr Gly Tyr Leu Cys Arg Ser Asn Thr  
420 425 430

Val Leu Ile Cys Lys Glu Pro Thr Gly Leu Lys Tyr Glu Lys Ala Lys  
435 440 445

Glu Trp Arg Ile Pro Cys Val Asn Ala Gln Trp Leu Gly Asp Ile Leu  
450 455 460

Leu Gly Asn Phe Glu Ala Leu Arg Gln Ile Gln Tyr Ser Arg Tyr Thr  
465 470 475 480

Ala Phe Ser Leu Gln Asp Pro Phe Ala Pro Thr Gln His Leu Val Leu  
485 490 495

Asn Leu Leu Asp Ala Trp Arg Val Pro Leu Lys Val Ser Ala Glu Leu  
500 505 510

Leu Met Ser Ile Arg Leu Pro Pro Lys Leu Lys Gln Asn Glu Val Ala  
515 520 525

Asn Val Gln Pro Ser Ser Lys Arg Ala Arg Ile Glu Asp Val Pro Pro  
530 535 540

Pro Thr Lys Lys Leu Thr Pro Glu Leu Thr Pro Phe Val Leu Phe Thr  
545 550 555 560

Gly Phe Glu Pro Val Gln Val Gln Gln Tyr Ile Lys Lys Leu Tyr Ile  
565 570 575

Leu Gly Gly Glu Val Ala Glu Ser Ala Gln Lys Cys Thr His Leu Ile  
580 585 590

Ala Ser Lys Val Thr Arg Thr Val Lys Phe Leu Thr Ala Ile Ser Val  
595 600 605

Val Lys His Ile Val Thr Pro Glu Trp Leu Glu Glu Cys Phe Arg Cys  
610 615 620

Gln Lys Phe Ile Asp Glu Gln Asn Tyr Ile Leu Arg Asp Ala Glu Ala  
625 630 635 640

Glu Val Leu Phe Ser Phe Ser Leu Glu Glu Ser Leu Lys Arg Ala His  
645 650 655

Val Ser Pro Leu Phe Lys Ala Lys Tyr Phe Tyr Ile Thr Pro Gly Ile  
660 665 670

Cys Pro Ser Leu Ser Thr Met Lys Ala Ile Val Glu Cys Ala Gly Gly  
675 680 685

Lys Val Leu Ser Lys Gln Pro Ser Phe Arg Lys Leu Met Glu His Lys  
690 695 700

Gln Asn Ser Ser Leu Ser Glu Ile Ile Leu Ile Ser Cys Glu Asn Asp  
705 710 715 720



Leu His Leu Cys Arg Glu Tyr Phe Ala Arg Gly Ile Asp Val His Asn  
725 730 735

Ala Glu Phe Val Leu Thr Gly Val Leu Thr Gln Thr Leu Asp Tyr Glu  
740 745 750

Ser Tyr Lys Phe Asn  
755

<210> 16  
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<212> PRT  
<213> Homo sapiens

<400> 16

Met Ser Asp Gln Ala Pro Lys Val Pro Glu Glu Met Phe Arg Glu Val  
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Lys Tyr Tyr Ala Val Gly Asp Ile Asp Pro Gln Val Ile Gln Leu Leu  
20 25 30

Lys Ala Gly Lys Ala Lys Glu Val Ser Tyr Asn Ala Leu Ala Ser His  
35 40 45

Ile Ile Ser Glu Asp Gly Asp Asn Pro Glu Val Gly Glu Ala Arg Glu  
50 55 60

Val Phe Asp Leu Pro Val Val Lys Pro Ser Trp Val Ile Leu Ser Val  
65 70 75 80

Gln Cys Gly Thr Leu Leu Pro Val Asn Gly Phe Ser Pro Glu Ser Cys  
85 90 95

Gln Ile Phe Phe Gly Ile Thr Ala Cys Leu Ser Gln Val Ser Ser Glu  
100 105 110

Asp Arg Ser Ala Leu Trp Ala Leu Val Thr Phe Tyr Gly Gly Asp Cys  
115 120 125

Gln Leu Thr Leu Asn Lys Lys Cys Thr His Leu Ile Val Pro Glu Pro  
130 135 140

Lys Gly Glu Lys Tyr Glu Cys Ala Leu Lys Arg Ala Ser Ile Lys Ile  
145 150 155 160

Val Thr Pro Asp Trp Val Leu Asp Cys Val Ser Glu Lys Thr Lys Lys  
165 170 175

Asp Glu Ala Phe Tyr His Pro Arg Leu Ile Ile Tyr Glu Glu Glu Glu  
180 185 190

Glu Glu Glu Glu Glu Glu Glu Glu Val Glu Asn Glu Glu Gln Asp Ser  
195 200 205

Gln Asn Glu Gly Ser Thr Asp Glu Lys Ser Ser Pro Ala Ser Ser Gln  
210 215 220

Glu Gly Ser Pro Ser Gly Asp Gln Gln Phe Ser Pro Lys Ser Asn Thr  
225 230 235 240

Glu Lys Ser Lys Gly Glu Leu Met Phe Asp Asp Ser Ser Asp Ser Ser  
245 250 255

Pro Glu Lys Gln Glu Arg Asn Leu Asn Trp Thr Pro Ala Glu Val Pro  
260 265 270

Gln Leu Ala Ala Ala Lys Arg Arg Leu Pro Gln Gly Lys Glu Pro Gly  
275 280 285

Leu Ile Asn Leu Cys Ala Asn Val Pro Pro Val Pro Gly Asn Ile Leu  
290 295 300

Pro Pro Glu Val Arg Gly Asn Leu Met Ala Ala Gly Gln Asn Leu Gln  
305 310 315 320

Ser Ser Glu Arg Ser Glu Met Ile Ala Thr Trp Ser Pro Ala Val Arg  
325 330 335

Thr Leu Arg Asn Ile Thr Asn Asn Ala Asp Ile Gln Gln Met Asn Arg  
340 345 350

Pro Ser Asn Val Ala His Ile Leu Gln Thr Leu Ser Ala Pro Thr Lys  
355 360 365

Asn Leu Glu Gln Gln Val Asn His Ser Gln Gln Gly His Thr Asn Ala  
370 375 380

Asn Ala Val Leu Phe Ser Gln Val Lys Val Thr Pro Glu Thr His Met  
 385 390 395 400

Leu Gln Gln Gln Gln Gln Ala Gln Gln Gln Gln Gln Gln His Pro Val  
 405 410 415

Leu His Leu Gln Pro Gln Gln Ile Met Gln Leu Gln Gln Gln Gln Gln  
 420 425 430

Gln Gln Ile Ser Gln Gln Pro Tyr Pro Gln Gln Pro Pro His Pro Phe  
 435 440 445

Ser Gln Gln Gln Gln Gln Gln Gln Gln Ala His Pro His Gln Phe Ser  
 450 455 460

Gln Gln Gln Leu Gln Phe Pro Gln Gln Gln Leu His Pro Pro Gln Gln  
 465 470 475 480

Leu His Arg Pro Gln Gln Gln Leu Gln Pro Phe Gln Gln Gln His Ala  
 485 490 495

Leu Gln Gln Gln Phe His Gln Leu Gln Gln His Gln Leu Gln Gln Gln  
 500 505 510

Gln Leu Ala Gln Leu Gln Gln Gln His Ser Leu Leu Gln Gln Gln Gln  
 515 520 525

Gln Gln Gln Ile Gln Gln Gln Gln Leu Gln Arg Met His Gln Gln Gln  
 530 535 540

Gln Gln Gln Gln Met Gln Ser Gln Thr Ala Pro His Leu Ser Gln Thr  
 545 550 555 560

Ser Gln Ala Leu Gln His Gln Val Pro Pro Gln Gln Pro Pro Gln Gln  
 565 570 575

Gln Gln Gln Gln Gln Pro Pro Pro Ser Pro Gln Gln His Gln Leu Phe  
 580 585 590

Gly His Asp Pro Ala Val Glu Ile Pro Glu Glu Gly Phe Leu Leu Gly  
 595 600 605

Cys Val Phe Ala Ile Ala Asp Tyr Pro Glu Gln Met Ser Asp Lys Gln  
 610 615 620

Leu Leu Ala Thr Trp Lys Arg Ile Ile Gln Ala His Gly Gly Thr Val  
 625 630 635 640

Asp Pro Thr Phe Thr Ser Arg Cys Thr His Leu Leu Cys Glu Ser Gln  
 645 650 655

Val Ser Ser Ala Tyr Ala Gln Ala Ile Arg Glu Arg Lys Arg Cys Val  
 660 665 670

Thr Ala His Trp Leu Asn Thr Val Leu Lys Lys Lys Lys Met Val Pro  
 675 680 685

Pro His Arg Ala Leu His Phe Pro Val Ala Phe Pro Pro Gly Gly Lys  
 690 695 700

Pro Cys Ser Gln His Ile Ile Ser Val Thr Gly Phe Val Asp Ser Asp  
 705 710 715 720

Arg Asp Asp Leu Lys Leu Met Ala Tyr Leu Ala Gly Ala Lys Tyr Thr  
 725 730 735

Gly Tyr Leu Cys Arg Ser Asn Thr Val Leu Ile Cys Lys Glu Pro Thr  
 740 745 750

Gly Leu Lys Tyr Glu Lys Ala Lys Glu Trp Arg Ile Pro Cys Val Asn  
 755 760 765

Ala Gln Trp Leu Gly Asp Ile Leu Leu Gly Asn Phe Glu Ala Leu Arg  
 770 775 780

Gln Ile Gln Tyr Ser Arg Tyr Thr Ala Phe Ser Leu Gln Asp Pro Phe  
 785 790 795 800

Ala Pro Thr Gln His Leu Val Leu Asn Leu Leu Asp Ala Trp Arg Val  
 805 810 815

Pro Leu Lys Val Ser Ala Glu Leu Leu Met Ser Ile Arg Leu Pro Pro  
 820 825 830

Lys Leu Lys Gln Asn Glu Val Ala Asn Val Gln Pro Ser Ser Lys Arg

|  |     |     |
|--|-----|-----|
| 835  | 840 | 845 |
| Ala Arg Ile Glu Asp Val Pro Pro Pro Thr Lys Lys Leu Thr Pro Glu<br>850 855 860     |     |     |
| Leu Thr Pro Phe Val Leu Phe Thr Gly Phe Glu Pro Val Gln Val Gln<br>865 870 875 880 |     |     |
| Gln Tyr Ile Lys Lys Leu Tyr Ile Leu Gly Gly Glu Val Ala Glu Ser<br>885 890 895     |     |     |
| Ala Gln Lys Cys Thr His Leu Ile Ala Ser Lys Val Thr Arg Thr Val<br>900 905 910     |     |     |
| Lys Phe Leu Thr Ala Ile Ser Val Val Lys His Ile Val Thr Pro Glu<br>915 920 925     |     |     |
| Trp Leu Glu Glu Cys Phe Arg Cys Gln Lys Phe Ile Asp Glu Gln Asn<br>930 935 940     |     |     |
| Tyr Ile Leu Arg Asp Ala Glu Ala Glu Val Leu Phe Ser Phe Ser Leu<br>945 950 955 960 |     |     |
| Glu Glu Ser Leu Lys Arg Ala His Val Ser Pro Leu Phe Lys Ala Lys<br>965 970 975     |     |     |
| Tyr Phe Tyr Ile Thr Pro Gly Ile Cys Pro Ser Leu Ser Thr Met Lys<br>980 985 990     |     |     |
| Ala Ile Val Glu Cys Ala Gly Gly Lys Val Leu Ser Lys Gln Pro Ser<br>995 1000 1005   |     |     |
| Phe Arg Lys Leu Met Glu His Lys Gln Asn Ser Ser Leu Ser Glu<br>1010 1015 1020      |     |     |
| Ile Ile Leu Ile Ser Cys Glu Asn Asp Leu His Leu Cys Arg Glu<br>1025 1030 1035      |     |     |
| Tyr Phe Ala Arg Gly Ile Asp Val His Asn Ala Glu Phe Val Leu<br>1040 1045 1050      |     |     |
| Thr Gly Val Leu Thr Gln Thr Leu Asp Tyr Glu Ser Tyr Lys Phe<br>1055 1060 1065      |     |     |

Asn

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<211> 2137  
<212> DNA  
<213> Homo sapiens

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gattccacgg ctttttcgag gacaacgact tcgtgttcgt ggtgttgag ctctgccgcc 480  
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|--|------|
| tcttcaatga ctcaacacgc ctcacacctct acaatgatgg tgacagcctg cagtacatag | 1440 |
| agcgtgacgg cactgagtcc tacctcaccg tgagttccca tcccaactcc ttgatgaaga  | 1500 |
| agatcacctt ccttaaatat ttccgcaatt acatgagcga gcacttgctg aaggcaggtg  | 1560 |
| ccaacatcac gccgcgcgaa ggtgatgagc tcgcccggct gccctaccta cggacctggt  | 1620 |
| tccgcacccg cagcgccatc atcctgcacc tcagcaacgg cagcgtgcag atcaacttct  | 1680 |
| tccaggatca caccaagctc atcttgtgcc cactgatggc agccgtgacc tacatcgacg  | 1740 |
| agaagcggga cttccgcaca taccgcctga gtctcctgga ggagtacggc tgctgcaagg  | 1800 |
| agctggccag ccggctccgc tacgcccga ctatggtgga caagctgctg agctcacgct   | 1860 |
| cggccagcaa ccgtctcaag gcctccta at agctgccctc ccctccggac tggtgccctc | 1920 |
| ctcactccca cctgcatctg gggcccatc tggttggctc ccgcggtgcc atgtctgcag   | 1980 |
| tgtgcccccc agccccggtg gctgggcaga gctgcatcat ccttgacagg gggggttgc   | 2040 |
| gtataagtta tttttgtaca tgttcgggtg tgggttctac agccttgctc ccctccccct  | 2100 |
| caaccccacc atatgaattg tacagaatat ttctatt                           | 2137 |

<210> 18  
 <211> 2204  
 <212> DNA  
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| ctgcagtgac tgcagggaaag ctggcacggg caccggccga ccctgggaaa gccggggtcc | 120 |
| ccggagttgc agctcccga gctccggcgg cggctccacc ggcgaaagag atcccggagg   | 180 |
| tcctagtgga cccacgcagc cggcggcgct atgtgcgggg ccgctttttg ggcaagggcg  | 240 |
| gctttgcaa gtgcttcgag atctcggacg cggacaccaa ggaggtgttc gcgggcaaga   | 300 |
| ttgtgcctaa gtctctgctg ctcaagccgc accagaggga gaagatgtcc atggaaatat  | 360 |
| ccattcaccg cagcctcgcc caccagcacg tcgtaggatt ccacggcttt ttcgaggaca  | 420 |
| acgacttcgt gttcgtggtg ttggagctct gccgccggag gtctctcctg gagctgcaca  | 480 |
| agaggaggaa agccctgact gagcctgagg cccgatacta cctacggcaa attgtgcttg  | 540 |
| gctgccagta cctgcaccga aaccgagtta ttcatcgaga cctcaagctg ggcaaccttt  | 600 |
| tcctgaatga agatctggag gtgaaaatag gggatttttg actggcaacc aaagtcgaat  | 660 |
| atgacgggga gaggaagaag accctgtgtg ggactcctaa ttacatagct cccgaggtgc  | 720 |

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| tgagcaagaa agggcacagt ttcgaggtgg atgtgtggtc cattgggtgt atcatgtata  | 780  |
| ccttgtagt gggcaaacca ccttttgaga cttcttgctt aaaagagacc tacctccgga   | 840  |
| tcaagaagaa tgaatacagt attcccaagc acatcaaccc cgtggcgcc tccctcatcc   | 900  |
| agaagatgct tcagacagat cccactgccc gcccaacct taacgagctg cttaatgacg   | 960  |
| agttctttac ttctggctat atccctgccc gtctcccat cacctgctg accattccac    | 1020 |
| caaggttttc gattgctccc agcagcctgg accccagcaa ccggaagccc ctcacagtcc  | 1080 |
| tcaataaagg cttggagaac cccctgctg agcgtccccg ggaaaaagaa gaaccagtgg   | 1140 |
| ttcgagagac aggtgaggtg gtcgactgcc acctcagtga catgctgcag cagctgcaca  | 1200 |
| gtgtcaatgc ctccaagccc tcggagcgtg ggctggtcag gcaagaggag gctgaggatc  | 1260 |
| ctgcctgcat ccccatcttc tgggtcagca agtgggtgga ctattcggac aagtacggcc  | 1320 |
| ttgggtatca gctctgtgat aacagcgtgg ggggtgctctt caatgactca acacgcctca | 1380 |
| tcctctacaa tgatggtgac agcctgcagt acatagagcg tgacggcact gagtccctacc | 1440 |
| tcaccgtgag ttcccatccc aactccttga tgaagaagat caccctcctt aaatatttcc  | 1500 |
| gcaattacat gagcgagcac ttgctgaagg caggtgccaa catcacgccg cgcgaagggtg | 1560 |
| atgagctcgc ccggctgccc tacctacgga cctgggtccg caccgcagc gccatcatcc   | 1620 |
| tgcacctcag caacggcagc gtgcagatca acttcttcca ggatcacacc aagctcatct  | 1680 |
| tgtgcccact gatggcagcc gtgacctaca tcgacgagaa gcgggacttc cgcacatacc  | 1740 |
| gcctgagtct cctggaggag tacggctgct gcaaggagct ggccagccgg ctccgctacg  | 1800 |
| ccgcactat ggtggacaag ctgctgagct cacgctcggc cagcaaccgt ctcaaggcct   | 1860 |
| cctaatagct gccctcccct ccggactggg gccctcctca ctcccacctg catctggggc  | 1920 |
| ccatactggg tggtccccgc ggtgccatgt ctgcagtgtg cccccagcc ccggtggctg   | 1980 |
| ggcagagctg catcatcctt gcagggtggg gttgctgtgt aagttatttt tgtacatgtt  | 2040 |
| cgggtgtggg ttctacagcc ttgtccccct cccctcaac ccaccatat gaattgtaca    | 2100 |
| gaatatttct attgaattcg gaactgtcct ttccttggct ttatgcacat taaacagatg  | 2160 |
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<210> 19  
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 <212> DNA  
 <213> Homo sapiens



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| ggcgaccatg gagcttttgc ggactatcac ctaccagcca gccgccagca ccaaaatgtg  | 180  |
| cgagcaggcg ctgggcaagg gttgcggagc ggactcgaag aagaagcggc cgccgcagcc  | 240  |
| ccccgaggaa tcgcagccac ctcagtccca ggcgcaagtg cccccggcgg cccctcacca  | 300  |
| ccatcaccac cattcgcact cggggccgga gatctcgcg attatcgtcg accccacgac   | 360  |
| tgggaagcgc tactgccggg gcaaagtgtt gggaaagggt ggctttgcaa aatgttacga  | 420  |
| gatgacagat ttgacaaata acaaagtcta cgccgcaaaa attattcctc acagcagagt  | 480  |
| agctaaacct catcaaaggg aaaagattga caaagaaata gagcttcaca gaattcttca  | 540  |
| tcataagcat gtagtgcaat tttaccacta cttcgaggac aaagaaaaca tttacattct  | 600  |
| cttggaaatac tgcagtagaa ggtcaatggc tcatattttg aaagcaagaa aggtgttgac | 660  |
| agagccagaa gttcgatact acctcaggca gattgtgtct ggactgaaat accttcatga  | 720  |
| acaagaaatc ttgcacagag atctcaaact agggaaacttt tttattaatg aagccatgga | 780  |
| actaaaagtt ggggacttcg gtctggcagc caggctagaa cccttggaac acagaaggag  | 840  |
| aacgatatgt ggtaccccaa attatctctc tcctgaagtc ctcaacaaac aaggacatgg  | 900  |
| ctgtgaatca gacatttggg ccctgggctg tgtaatgtat acaatgttac tagggaggcc  | 960  |
| cccatttgaa actacaaatc tcaaagaaac ttataggtgc ataagggaag caaggtatac  | 1020 |
| aatgccgtcc tcattgctgg ctctgcca gcaacttaatt gctagtatgt tgtccaaaaa   | 1080 |
| cccagaggat cgtcccagtt tggatgacat cattcgacat gacttttttt tgcaaggcct  | 1140 |
| cactccggac agactgtctt ctagctgttg tcatacagtt ccagatttcc acttatcaag  | 1200 |
| cccagctaag aatttcttta agaaagcagc tgctgtctct tttggtggca aaaaagacaa  | 1260 |
| agcaagatat attgacacac ataataagagt gtctaaagaa gatgaagaca tctacaagct | 1320 |
| taggcatgat ttgaaaaaga cttcaataac tcagcaaccc agcaaacaca ggacagatga  | 1380 |
| ggagctccag ccacctacca ccacagttgc caggctctga acaccgcag tagaaaacaa   | 1440 |
| gcagcagatt ggggatgcta ttcggatgat agtcagaggg actcttggca gctgtagcag  | 1500 |
| cagcagtgaa tgccttgaag acagtaccat gggaaagtgt gcagacacag tggcaagggt  | 1560 |
| tcttcgggga tgtctggaaa acatgccgga agctgattgc attcccaaag agcagctgag  | 1620 |
| cacatcattt cagtgggtca ccaaatgggt tgattactct aacaaatatg gctttgggta  | 1680 |

|   |      |
|---|------|
| ccagctctca gaccacaccg tcggtgtcct tttcaacaat ggtgctcaca tgagcctcct | 1740 |
| tccagacaaa aaaacagttc actattacgc agagcttggc caatgctcag ttttcccagc | 1800 |
| aacagatgct cctgagcaat ttattagtca agtgacggtg ctgaaatact tttctcatta | 1860 |
| catggaggag aacctcatgg atggtggaga tctgcctagt gttactgata ttcgaagacc | 1920 |
| tcggctctac ctccttcagt ggctaaaatc tgataaggcc ctaatgatgc tctttaatga | 1980 |
| tggcaccttt caggtgaatt tctacatga tcatacaaaa atcatcatct gtagccaaaa  | 2040 |
| tgaagaatac cttctcacct acatcaatga ggataggata tctacaactt tcaggctgac | 2100 |
| aactctgctg atgtctggct gttcatcaga attaaaaaat cgaatggaat atgccctgaa | 2160 |
| catgctctta caaagatgta actgaaagac ttttcgaatg gaccctatgg gactcctctt | 2220 |
| ttccactgtg agatctacag ggaagccaaa agaatzatct agagtatgtt gaagaagatg | 2280 |
| gacatgtggt ggtacgaaaa caattcccct gtggcctgct ggactgggtt gaaccagAAC | 2340 |
| aggctaaggc atacagttct tgactttgga caatccaaga gtgaaccaga atgcagtttt | 2400 |
| ccttgagata cctgttttaa aagggttttc agacaatttt gcagaaaggc gcattgattc | 2460 |
| ttaaattctc tctgttgaga gcatttcagc cagaggactt tggaactgtg aatatacttc | 2520 |
| ctgaagggga gggagaaggg aggaagctcc catgttggtt aaaggctgta attggagcag | 2580 |
| cttttggtg cgtaactgtg aactatggcc atatataatt ttttttcatt aatttttgaa  | 2640 |
| gatacttggt gctggaaaag tgcattcctt gttaataaac tttttattta ttacagccca | 2700 |
| aagagcagta tttattatca aaatgtcttt ttttttatgt tgaccatttt aaaccgttgg | 2760 |
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<210> 20  
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 <212> DNA  
 <213> Homo sapiens

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| gaaccgagaa gccgggaccg cgctgcgacg cgccggccgc atggagcctg ccgccggttt  | 120 |
| cctgtctccg cgccccctcc agcgtgcggc cgccgcgccc gctcccccg ccgggcccgg   | 180 |
| gccgcctccg agtgccctgc gcggacctga gctggagatg ctggccgggc taccgacgtc  | 240 |
| agaccccggg cgctcatca cggacccgcg cagcggccgc acctacctca aaggccgctt   | 300 |
| gttgggcaag gggggcttcg cccgctgcta cgaggccact gacacagaga ctggcagcgc  | 360 |

|  |      |
|--|------|
| ctacgctgtc aaagtcatcc cgcagagccg cgtcgccaag ccgcatcagc gcgagaagat  | 420  |
| cctaaatgag attgagctgc accgagacct gcagcaccgc cacatcgtgc gtttttcgca  | 480  |
| ccactttgag gacgctgaca acatctacat tttcttgag ctctgcagcc gaaagtcctt   | 540  |
| ggcccacatc tggaaggccc ggcacaccct gttggagcca gaagtgcgct actacctgcg  | 600  |
| gcagatcctt tctggcctca agtacttgca ccagcgcgcc atcttgacc gggacctcaa   | 660  |
| gttgggaaat tttttcatca ctgagaacat ggaactgaag gtgggggatt ttgggctggc  | 720  |
| agcccggttg gagcctccgg agcagaggaa gaagaccatc tgtggcacc ccaactatgt   | 780  |
| ggctccagaa gtgctgctga gacagggcca cgccctgag gcggatgtat ggtcactggg   | 840  |
| ctgtgtcatg tacacgctgc tctgcgggag cctcccttt gagacggctg acctgaagga   | 900  |
| gacgtaccgc tgcatacagc aggttcacta cacgctgcct gccagcctct cactgcctgc  | 960  |
| ccggcagctc ctggccgcca tccttcgggc ctcaccccca gaccgcccct ctattgacca  | 1020 |
| gatcctgcgc catgacttct ttaccaaggg ctacaccccc gatcgactcc ctatcagcag  | 1080 |
| ctgcgtgaca gtcccagacc tgacaccccc caaccagct aggagtctgt ttgccaaagt   | 1140 |
| taccaagagc ctctttggca gaaagaagaa gagtaagaat catgcccagg agagggatga  | 1200 |
| ggtctccggt ttggtgagcg gcctcatgag cacatccgtt ggccatcagg atgccaggcc  | 1260 |
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| cagctcacc cgtgggacac tggcaagcag tggagatgga tttgaagaag gtctgactgt   | 1380 |
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| agcggaacag aaccggcccc cctggcccc gccagagcct ctggtgtggg tcagcaagtg   | 1500 |
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| tcccaccagc acaaagcact tctccttctc cgtgggtgct gtgccccggg cctgcagcc   | 1680 |
| tcagctgggt atcctgcggt acttcgcctc ctacatggag cagcacctca tgaagggtgg  | 1740 |
| agatctgccc agtgtggaag aggtagaggt acctgctccg ccttgctgc tgcagtgggt   | 1800 |
| caagacggat caggctctcc tcatgctgtt tagtgatggc actgtccagg tgaacttcta  | 1860 |
| cggggaccac accaagctga ttctcagtgg ctgggagccc ctccttgatga cttttgtggc | 1920 |
| ccgaaatcgt agtgcttgta cttacctgc tccccacctt cggcagctgg gctgctctcc   | 1980 |
| agacctgcgg cagcgactcc gctatgctct gcgcctgctc cgggaccgca gccagccta   | 2040 |
| ggaccaagc cctgaggcct gaggcctgtg cctgtcaggc tctggccctt gcctttgtgg   | 2100 |

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| ccttccccct | tcctttggtg | cctcactggg | ggctttgggc | cgaatcccc  | agggaatcag | 2160 |
| ggaccagctt | tactggagtt | gggggcggct | tgtcttcgct | ggctcctacc | ccatctccaa | 2220 |
| gataagcctg | agccttagct | cccagctagg | gggcgttatt | tatggaccac | ttttatttat | 2280 |
| tgtcagacac | ttatttattg | ggatgtgagc | cccagggggg | cctcctccta | ggataataaa | 2340 |
| caattttgca | gaattggaaa | aaaaaaaaa  |            |            |            | 2369 |

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 <211> 2381  
 <212> DNA  
 <213> Homo sapiens

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| caggcgctc  | aatactcgag ctttaatagc cggcaccocg cactatggct caagtggccg 180  |
| gtaagaaact | gactgtggcc ccagaggccg ctaaaccoccc aggaattccc gggagctcct 240 |
| cggccgtcaa | agagatccca gagattctag tggatccocg aaccocggagg cgatacctga 300 |
| gaggtcgatt | cctgggcaaa ggtggattcg ccaagtgcta cgagatcacc gacctggaga 360  |
| gccgggaggt | atttgctggg aagattgtgc ccaagaccat gttgctcaag ccccaccaga 420  |
| aggataagat | gaccatggag atcgccatcc agcgcagcct ggaccaccgg catgtcgtgg 480  |
| gcttccatgg | cttctttgag gacaatgact tegtgtatgt ggtactggag ctgtgcagga 540  |
| ggaggtctct | gttggagctg cacaagagga gaaaagcgggt tacagagcca gaagctcgct 600 |
| actatttgaa | acagaccatt tcgggatgtc agtatctcca tagcaaccga gtcattcaca 660  |
| gagacctcaa | gctcggaaac ttgttcctta atgatgaaat ggaggtcaaa ataggtgact 720  |
| ttgggctggc | aaccaaagtg gaatatgatg gcgagcgcaa aaagaccctc tgtggcactc 780  |
| caaactacat | tgcacctgag gtgttgggca agaagggccca cagttttgaa gtggacatat 840 |
| ggtcaatagg | atgcatcatg tacacactgc tgggtggggaa acctcccttt gagacatcat 900 |
| gcctgaaaga | aacctacatg agaattaaaa agaatgaata ctccatcccc aagcacatta 960  |
| acctgtggc  | agcagcactt atacagaaga tgctccgttc tgaccaacc tcaaggccca 1020  |
| caatagacga | cttgctgaat gacgagttct ttacttctgg ctacattcct tcccggctcc 1080 |
| ccacaacctg | cttaactgtg cccccaaggt tttccattgc gccagcact attgatcaaa 1140  |
| gcttaaggaa | gccacttact gcaattaata aagggaaga ctctccactg gttgaaaagc 1200  |

|  |      |
|--|------|
| agggtggctcc tgcaaaggaa gaggagatgc agcagccgga gttcacggag cctgcagatt | 1260 |
| gttacctatc tgagatgctc cagcagctga catgtttgaa tgcagtcaag ccttctgaga  | 1320 |
| gagcgcttat ccgccaagag gaagccgagg atccggcatc cattcccata ttctggatca  | 1380 |
| gcaaatgggt ggattactcg gacaaatacg gattaggata tcagctgtgt gataacagtg  | 1440 |
| taggggtgct cttcaatgac tccacacggt tgataatgta caatgatgga gacagcctgc  | 1500 |
| agtacattga gcggaacaat acagaatcct acctcaacgt gcgctcctac cctactacct  | 1560 |
| taacaaaaaa gatcacactg ctgaagtact tcagaaacta catgagtga cacctattga   | 1620 |
| aggccggtgc caacacgact cctcgggagg gtgatgaact ggctcgtctc cccttcttgc  | 1680 |
| gcacctgggt ccggacacgc agtgccatta tccttcacct gagcaatgga actgttcaga  | 1740 |
| tcaacttctt ccaggatcac accaagataa tcctgtgccc ccttatggct gcggtgtcct  | 1800 |
| acatagatga aaagcgtgag ttccgcacgt acaagctgag cctgattcaa gaatttggct  | 1860 |
| gctgcaaaga gctcgcaagc cgtctccggt acgcacgcac aatggtggag aaacttcaga  | 1920 |
| gctcaaagtc agccgttgca cacgtaaagg cctcggcata gccggccaag caaactatgg  | 1980 |
| actccccaga aacaaacca tattcttggg tttctggaag cacaagacct tgtttcaagt   | 2040 |
| cctaggagca cccgtctttt taattttaag ccgaagctga catgttctag ggtgagatgg  | 2100 |
| ttcgttaagc ttgccaagac tgtacagtac tcgcgtgacg tttccataaa aatatatctt  | 2160 |
| aagtgccact cgttgctctt gggtaatcat ggatatgtga tgtagatacc tgctgggctc  | 2220 |
| tgtatgaacc tgtgtcctcc tgtttttctc tgtcaacggt gtctgggttt taatgtaaaa  | 2280 |
| atataatctt taatactttt gtatattatc agattaaagt tctttgtata gccgtggaaa  | 2340 |
| aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaactcga g                      | 2381 |

<210> 22  
 <211> 2379  
 <212> DNA  
 <213> Homo sapiens

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| cgaaacgggc acaccaattc agctgacgct tcacgtccaa ttcatttttg catttaaaaa | 60  |
| atcgaacggt ttcggcgcgt tctccgcttt gtgcttggtt ttcgtgcatt cgatgggcaa | 120 |
| aaccgagatt tgatcgccgc ttctcttgtc aaccgtgtgg atctgatctc cgtttccgag | 180 |
| gcactttcag ccgatcgccg gtggaattat aggctcagaa cgaggagtat cgccgcaaaa | 240 |
| ctccaggcga acgcaaacgc aaaaggggca gtccgtagta aagaagaaag gagagcaaga | 300 |

|  |      |
|--|------|
| tggccgcgaa gcccgaggat aagagcacgg atattccgga tcgcctcgtc gacatcaacc  | 360  |
| agcggaaaac ctacaagcgc atgcggttct tcggcaaggg cgggtttgca aaatgttacg  | 420  |
| agatcatcga tgtggaaacc gacgacgtct tcgccggcaa gatcgatatcc aagaagctga | 480  |
| tgatcaaaca caatcagaag gagaagaccg cccaggagat aactattcac cgcagcctta  | 540  |
| accatccgaa cattgtcaag tttcacaact actttgaaga ttgcgagaat atctacattg  | 600  |
| tgctggagct gtgcaagaaa agatccatga tggagctgca caaacgtagg aaaagcatta  | 660  |
| cggagttcga atgccgctac tacattttacc agataatcca gggcgtaag tacttgcacg  | 720  |
| ataaccgcat tatccatcga gatctgaagc tgggcaatct cttcctcaac gatttggtgc  | 780  |
| acgtgaagat cggggatttc gggttggcca cgcgcattga gtatgagggc gagcgaaaaa  | 840  |
| agaccttatg cggaacgccc aactatatag ccccgagat cctcaccaag aagggccact   | 900  |
| ccttcgaggt ggacatctgg tcgattggct gcgtcatgta cacactgctt gtgggccagc  | 960  |
| cgccgttcga aaccaagact ctgaaggata cgtactcgaa aatcaagaag tgcgagtacc  | 1020 |
| gcgtgcccag ctacttaagg aaaccggcgg cggatatggt catcgccatg ctgcagccaa  | 1080 |
| atccggagag cgcgccggca attggtcagc tgctgaactt tgagttcctc aagggctcaa  | 1140 |
| aggtgcccac gttcttgccc agctcttgct tgacaatggc gccgcgtatc ggcagcaacg  | 1200 |
| acaccatcga ggattcgatg caccgcaagc cactgatgga gatgaacggc atcaggccccg | 1260 |
| acgacactcg tctggagtcg accttcctca aggccaatct gcacgacgcc attaccgcgt  | 1320 |
| cagcgcaggt gtgccgccac agcgaggact atcgcagcga tatcgagagc ctgtaccagc  | 1380 |
| agctcactaa tcttatcaac ggaaagccgc gaattctgca aggcaatctg ggcgacgaga  | 1440 |
| acacagatcc tgcagcgcag ccgctcttct ggatatccaa gtgggttgac tacagcgaca  | 1500 |
| agtacggatt tggttaccag ctgtgcgatg agggcatcgg cgtgatgttc aacgacacca  | 1560 |
| caaagctgat cctgctgccg aatcagatca acgtacactt catcgacaag gatggcaagg  | 1620 |
| agacgtacat gaccaccacg gattactgca agtcgcttga caagaagatg aagctgctgt  | 1680 |
| cgtactttaa gcgctacatg atcgagcacc tggatgaaggc aggtgccaac aatgtgaaca | 1740 |
| ttgagagcga tcaaactctg cgtatgcccc atttacactc ctggttccgt acaacatgtg  | 1800 |
| ccgtagttat gcatttgacc aacggttctg tgcagctaaa cttctcagat cacatgaagc  | 1860 |
| tcatcctctg cccgcgcgatg agtgctataa cctatatgga ccaggagaag aacttccgca | 1920 |
| cctaccgatt ttcgaccatt gtggagaacg gcgtgtctaa agacttgtag cagaagatcc  | 1980 |

|            |            |            |            |            |            |      |
|------------|------------|------------|------------|------------|------------|------|
| gatatgccca | ggagaaactt | aggaaaatgc | tggagaagat | gttcacataa | gcgtagccag | 2040 |
| cccaactatc | attataaggc | cgaatgttag | tttaacgtaa | ttcacgaatg | ccctggccaa | 2100 |
| cttcatttat | agcccagaaa | gtatcctcct | ctcccatcat | cttttaaaat | tgtagttccc | 2160 |
| gttcaaattg | atttgttcga | tgtttataga | atttatttgt | ttttgcccct | tccccttcat | 2220 |
| atcgaaaata | ctgcttaagt | tatattcatc | gtcagtgttg | ggcctccctc | aaaagtaatt | 2280 |
| taatatatct | gtttaatggg | tttcgtacac | gatccgatca | cttaatgcat | tttaaagaga | 2340 |
| tcaaattaaa | tgtttaaact | aaaaaaaaaa | aaaaaaaaaa |            |            | 2379 |

<210> 23  
 <211> 2629  
 <212> DNA  
 <213> *Drosophila melanogaster*

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| taaaaaatcg | aacggtttcg gcgcgttctc cgctttgtgc ttggttttcg tgcattcgat 120   |
| gggcaaaacc | gagatttgat cgccgcttct cttgtcaacc gtgtggatct gatctccgtt 180   |
| tccgaggcac | tttcagccga tcgccgttg aattataggc tcagaacgag gagtatcgcc 240    |
| gcaaaactcc | aggcgaacgc aaacgcaaaa ggggcagtcc gtagtaaaga agaaaggaga 300   |
| gcaagatggc | cgcgaaagccc gaggataaga gcacggatat tccggatcgc ctcgtcgaca 360  |
| tcaaccagcg | gaaaacctac aagcgcatgc gggtcttcgg caagggcggg tttgcaaaat 420   |
| gttacgagat | catcgatgtg gaaaccgacg acgtcttcgc cggcaagatc gtatccaaga 480   |
| agctgatgat | caaacacaaat cagaaggaga agaccgccca ggagataact attcaccgca 540  |
| gccttaacca | tccgaacatt gtcaagtttc acaactactt tgaagattcg cagaatatct 600   |
| acattgtgct | ggagctgtgc aagaaaagat ccatgatgga gctgcacaaa cgtaggaaaa 660   |
| gcattacgga | gttcgaatgc cgctactaca ttaccagat aatccagggc gttaagtact 720    |
| tgcacgataa | ccgcattatc catcgagatc tgaagctggg caatctcttc ctcaacgatt 780   |
| tgttgcacgt | gaagatcggg gatttcgggt tggccacgcg cattgagtat gagggcgagc 840   |
| gaaaaaagac | cttatgcgga acgccaact atatagcccc ggagatcctc accaagaagg 900    |
| gccactcctt | cgagggtggac atctggctcga ttggctgcgt catgtacaca ctgcttgtgg 960 |
| gccagccgcc | gttcgaaacc aagactctga aggatacgta ctcgaaaatc aagaagtgcg 1020  |
| agtaccgcgt | gcccagctac ttaaggaaac cggcggcgga tatgggtcatc gccatgctgc 1080 |

|            |            |             |            |            |            |      |
|------------|------------|-------------|------------|------------|------------|------|
| agccaaatcc | ggagagccgc | ccggcaattg  | gtcagctgct | gaactttgag | ttcctcaagg | 1140 |
| gctcaaaggt | gcccattgtt | ttgcccagct  | cttgtctgac | aatggcgccg | cgtatcggca | 1200 |
| gcaacgacac | catcgaggat | tcgatgcacc  | gcaagccact | gatggagatg | aacggcatca | 1260 |
| ggcccgcaga | cactcgtctg | gagtcgacct  | tcctcaaggc | caatctgcac | gacgccatta | 1320 |
| ccgcgtcagc | gcaggtgtgc | cgccacagcg  | aggactatcg | cagcgatatc | gagagcctgt | 1380 |
| accagcagct | cactaatctt | atcaacggaa  | agccgcgaat | tctgcaaggc | aatctgggcg | 1440 |
| acgagaacac | agatcctgca | gcgcagccgc  | tcttctggat | atccaagtgg | gttgactaca | 1500 |
| gcgacaagta | cggattttgg | taccagctgt  | gcgatgaggg | catcggcgtg | atgttcaacg | 1560 |
| acaccacaaa | gctgatcctg | ctgccgaatc  | agatcaacgt | acacttcac  | gacaaggatg | 1620 |
| gcaaggagac | gtacatgacc | accacggatt  | actgcaagtc | gcttgacaag | aagatgaagc | 1680 |
| tgctgtcgta | ctttaagcgc | tacatgatcg  | agcacctggg | gaaggcaggt | gccaacaatg | 1740 |
| tgaacattga | gagcgatcaa | atctcgcgta  | tgccccattt | acactcctgg | ttccgtacaa | 1800 |
| catgtgccgt | agttatgcat | ttgaccaacg  | gttctgtgca | gctaaacttc | tcagatcaca | 1860 |
| tgaagctcat | cctctgcccg | cgcatgagtg  | ctataaccta | tatggaccag | gagaagaact | 1920 |
| tccgcaccta | ccgattttcg | accattgtgg  | agaacggcgt | gtctaaagac | ttgtaccaga | 1980 |
| agatccgata | tgcccaggag | aaacttagga  | aaatgctgga | gaagatgttc | acataagcgt | 2040 |
| agccagccca | actatcatta | taaggccgaa  | tgtagtttta | acgtaattca | cgaatgcctt | 2100 |
| ggccaacttc | atttatagcc | cagaaaagtat | cctcctctcc | catcatcttt | taaaattgta | 2160 |
| gttcccgttc | aaattgattt | gttcgatgtt  | tatagaattt | atttgttttt | gccccttccc | 2220 |
| cttcatatcg | aaaatactgc | ttaagttata  | ttcatcgtca | gtgttggggc | tcctcaaaa  | 2280 |
| gtaatttaat | atatctgttt | aatggttttc  | gtacacgata | cgatcactta | atgcatttta | 2340 |
| aagagatcaa | attaaatggt | taaactaagc  | aaacgtgttt | cgaatgcctt | atattcaccg | 2400 |
| aggtgactga | taacaaaatt | ttaatgctgg  | atacattata | aaagtaatag | tgtaatattg | 2460 |
| tgcgttcgta | gtgcgctata | gcgccattta  | aaataatata | taagttacaa | tactgctgca | 2520 |
| aagtgtttaa | gtgtacaagt | atattcaact  | ttggccagaa | atatctgtag | ctataggata | 2580 |
| caatatgtaa | atgcttttga | actaaaagcg  | aatatatata | aaatttaaat |            | 2629 |

<210> 24  
 <211> 603  
 <212> PRT  
 <213> Homo sapiens



<400> 24

Met Ser Ala Ala Val Thr Ala Gly Lys Leu Ala Arg Ala Pro Ala Asp  
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Pro Gly Lys Ala Gly Val Pro Gly Val Ala Ala Pro Gly Ala Pro Ala  
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Ala Ala Pro Pro Ala Lys Glu Ile Pro Glu Val Leu Val Asp Pro Arg  
35 40 45

Ser Arg Arg Arg Tyr Val Arg Gly Arg Phe Leu Gly Lys Gly Gly Phe  
50 55 60

Ala Lys Cys Phe Glu Ile Ser Asp Ala Asp Thr Lys Glu Val Phe Ala  
65 70 75 80

Gly Lys Ile Val Pro Lys Ser Leu Leu Lys Pro His Gln Arg Glu  
85 90 95

Lys Met Ser Met Glu Ile Ser Ile His Arg Ser Leu Ala His Gln His  
100 105 110

Val Val Gly Phe His Gly Phe Phe Glu Asp Asn Asp Phe Val Phe Val  
115 120 125

Val Leu Glu Leu Cys Arg Arg Arg Ser Leu Leu Glu Leu His Lys Arg  
130 135 140

Arg Lys Ala Leu Thr Glu Pro Glu Ala Arg Tyr Tyr Leu Arg Gln Ile  
145 150 155 160

Val Leu Gly Cys Gln Tyr Leu His Arg Asn Arg Val Ile His Arg Asp  
165 170 175

Leu Lys Leu Gly Asn Leu Phe Leu Asn Glu Asp Leu Glu Val Lys Ile  
180 185 190

Gly Asp Phe Gly Leu Ala Thr Lys Val Glu Tyr Asp Gly Glu Arg Lys  
195 200 205

Lys Thr Leu Cys Gly Thr Pro Asn Tyr Ile Ala Pro Glu Val Leu Ser  
210 215 220

Lys Lys Gly His Ser Phe Glu Val Asp Val Trp Ser Ile Gly Cys Ile  
 225 230 235 240

Met Tyr Thr Leu Leu Val Gly Lys Pro Pro Phe Glu Thr Ser Cys Leu  
 245 250 255

Lys Glu Thr Tyr Leu Arg Ile Lys Lys Asn Glu Tyr Ser Ile Pro Lys  
 260 265 270

His Ile Asn Pro Val Ala Ala Ser Leu Ile Gln Lys Met Leu Gln Thr  
 275 280 285

Asp Pro Thr Ala Arg Pro Thr Ile Asn Glu Leu Leu Asn Asp Glu Phe  
 290 295 300

Phe Thr Ser Gly Tyr Ile Pro Ala Arg Leu Pro Ile Thr Cys Leu Thr  
 305 310 315 320

Ile Pro Pro Arg Phe Ser Ile Ala Pro Ser Ser Leu Asp Pro Ser Asn  
 325 330 335

Arg Lys Pro Leu Thr Val Leu Asn Lys Gly Leu Glu Asn Pro Leu Pro  
 340 345 350

Glu Arg Pro Arg Glu Lys Glu Glu Pro Val Val Arg Glu Thr Gly Glu  
 355 360 365

Val Val Asp Cys His Leu Ser Asp Met Leu Gln Gln Leu His Ser Val  
 370 375 380

Asn Ala Ser Lys Pro Ser Glu Arg Gly Leu Val Arg Gln Glu Glu Ala  
 385 390 395 400

Glu Asp Pro Ala Cys Ile Pro Ile Phe Trp Val Ser Lys Trp Val Asp  
 405 410 415

Tyr Ser Asp Lys Tyr Gly Leu Gly Tyr Gln Leu Cys Asp Asn Ser Val  
 420 425 430

Gly Val Leu Phe Asn Asp Ser Thr Arg Leu Ile Leu Tyr Asn Asp Gly  
 435 440 445

Asp Ser Leu Gln Tyr Ile Glu Arg Asp Gly Thr Glu Ser Tyr Leu Thr  
 450 455 460

Val Ser Ser His Pro Asn Ser Leu Met Lys Lys Ile Thr Leu Leu Lys  
 465 470 475 480

Tyr Phe Arg Asn Tyr Met Ser Glu His Leu Leu Lys Ala Gly Ala Asn  
 485 490 495

Ile Thr Pro Arg Glu Gly Asp Glu Leu Ala Arg Leu Pro Tyr Leu Arg  
 500 505 510

Thr Trp Phe Arg Thr Arg Ser Ala Ile Ile Leu His Leu Ser Asn Gly  
 515 520 525

Ser Val Gln Ile Asn Phe Phe Gln Asp His Thr Lys Leu Ile Leu Cys  
 530 535 540

Pro Leu Met Ala Ala Val Thr Tyr Ile Asp Glu Lys Arg Asp Phe Arg  
 545 550 555 560

Thr Tyr Arg Leu Ser Leu Leu Glu Glu Tyr Gly Cys Cys Lys Glu Leu  
 565 570 575

Ala Ser Arg Leu Arg Tyr Ala Arg Thr Met Val Asp Lys Leu Leu Ser  
 580 585 590

Ser Arg Ser Ala Ser Asn Arg Leu Lys Ala Ser  
 595 600

<210> 25  
 <211> 603  
 <212> PRT  
 <213> Mus musculus

<400> 25

Met Asn Ala Ala Ala Lys Ala Gly Lys Leu Ala Arg Ala Pro Ala Asp  
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Leu Gly Lys Gly Gly Val Pro Gly Asp Ala Val Pro Gly Ala Pro Val  
 20 25 30

Ala Ala Pro Leu Ala Lys Glu Ile Pro Glu Val Leu Val Asp Pro Arg

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 35  | 40  | 45  |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Ser | Arg | Arg | Gln | Tyr | Val | Arg | Gly | Arg | Phe | Leu | Gly | Lys | Gly | Gly | Phe |
| 50  |     |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Ala | Lys | Cys | Phe | Glu | Ile | Ser | Asp | Ala | Asp | Thr | Lys | Glu | Val | Phe | Ala |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Gly | Lys | Ile | Val | Pro | Lys | Ser | Leu | Leu | Leu | Lys | Pro | His | Gln | Lys | Glu |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Lys | Met | Ser | Met | Glu | Ile | Ser | Ile | His | Arg | Ser | Leu | Ala | His | Gln | His |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Val | Val | Gly | Phe | His | Asp | Phe | Phe | Glu | Asp | Ser | Asp | Phe | Val | Phe | Val |
|     |     | 115 |     |     |     |     |     | 120 |     |     |     | 125 |     |     |     |
| Val | Leu | Glu | Leu | Cys | Arg | Arg | Arg | Ser | Leu | Leu | Glu | Leu | His | Lys | Arg |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Arg | Lys | Ala | Leu | Thr | Glu | Pro | Glu | Ala | Arg | Tyr | Tyr | Leu | Arg | Gln | Ile |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Val | Leu | Gly | Cys | Gln | Tyr | Leu | His | Arg | Asn | Gln | Val | Ile | His | Arg | Asp |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Leu | Lys | Leu | Gly | Asn | Leu | Phe | Leu | Asn | Glu | Asp | Leu | Glu | Val | Lys | Ile |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Gly | Asp | Phe | Gly | Leu | Ala | Thr | Lys | Val | Glu | Tyr | Glu | Gly | Glu | Arg | Lys |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Lys | Thr | Leu | Cys | Gly | Thr | Pro | Asn | Tyr | Ile | Ala | Pro | Glu | Val | Leu | Ser |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Lys | Lys | Gly | His | Ser | Phe | Glu | Val | Asp | Val | Trp | Ser | Ile | Gly | Cys | Ile |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Met | Tyr | Thr | Leu | Leu | Val | Gly | Lys | Pro | Pro | Phe | Glu | Thr | Ser | Cys | Leu |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Lys | Glu | Thr | Tyr | Leu | Arg | Ile | Lys | Lys | Asn | Glu | Tyr | Ser | Ile | Pro | Lys |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |

His Ile Asn Pro Val Ala Ala Ser Leu Ile Gln Lys Met Leu Gln Thr  
 275 280 285

Asp Pro Thr Ala Arg Pro Thr Ile His Glu Leu Leu Asn Asp Glu Phe  
 290 295 300

Phe Thr Ser Gly Tyr Ile Pro Ala Arg Leu Pro Ile Thr Cys Leu Thr  
 305 310 315 320

Ile Pro Pro Arg Phe Ser Ile Ala Pro Ser Ser Leu Asp Pro Ser Ser  
 325 330 335

Arg Lys Pro Leu Lys Val Leu Asn Lys Gly Val Glu Asn Pro Leu Pro  
 340 345 350

Asp Arg Pro Arg Glu Lys Glu Glu Pro Val Val Arg Glu Thr Asn Glu  
 355 360 365

Ala Ile Glu Cys His Leu Ser Asp Leu Leu Gln Gln Leu Thr Ser Val  
 370 375 380

Asn Ala Ser Lys Pro Ser Glu Arg Gly Leu Val Arg Gln Glu Glu Ala  
 385 390 395 400

Glu Asp Pro Ala Cys Ile Pro Ile Phe Trp Val Ser Lys Trp Val Asp  
 405 410 415

Tyr Ser Asp Lys Tyr Gly Leu Gly Tyr Gln Leu Cys Asp Asn Ser Val  
 420 425 430

Gly Val Leu Phe Asn Asp Ser Thr Arg Leu Ile Leu Tyr Asn Asp Gly  
 435 440 445

Asp Ser Leu Gln Tyr Ile Glu Arg Asp Gly Thr Glu Ser Tyr Leu Thr  
 450 455 460

Val Ser Ser His Pro Asn Ser Leu Met Lys Lys Ile Thr Leu Leu Asn  
 465 470 475 480

Tyr Phe Arg Asn Tyr Met Ser Glu His Leu Leu Lys Ala Gly Ala Asn  
 485 490 495

Ile Thr Pro Arg Glu Gly Asp Glu Leu Ala Arg Leu Pro Tyr Leu Arg  
500 505 510

Thr Trp Phe Arg Thr Arg Ser Ala Ile Ile Leu His Leu Ser Asn Gly  
515 520 525

Thr Val Gln Ile Asn Phe Phe Gln Asp His Thr Lys Leu Ile Leu Cys  
530 535 540

Pro Leu Met Ala Ala Val Thr Tyr Ile Asn Glu Lys Arg Asp Phe Gln  
545 550 555 560

Thr Tyr Arg Leu Ser Leu Leu Glu Glu Tyr Gly Cys Cys Lys Glu Leu  
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Ala Ser Arg Leu Arg Tyr Ala Arg Thr Met Val Asp Lys Leu Leu Ser  
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Ser Arg Ser Ala Ser Asn Arg Leu Lys Ala Ser  
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<220>  
<221> MISC\_FEATURE  
<222> (3)..(6)  
<223> Xaa = any amino acid

<220>  
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<222> (7)..(7)  
<223> PHOSPHORYLATION

<220>  
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<400> 26

Met Ala Xaa Xaa Xaa Xaa Thr Pro Xaa Xaa Xaa Xaa Ala Lys Lys  
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<210> 27  
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<220>  
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<223> Xaa = any amino acid

<220>  
<221> MOD\_RES  
<222> (7)..(7)  
<223> PHOSPHORYLATION

<220>  
<221> MISC\_FEATURE  
<222> (9)..(12)  
<223> Xaa = any amino acid

<400> 27

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Xaa | Xaa | Xaa | Xaa | Ser | Pro | Xaa | Xaa | Xaa | Xaa | Ala | Lys | Lys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     | 15  |     |

<210> 28  
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<212> PRT  
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<220>  
<223> synthetic

<220>  
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<220>  
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<223> PHOSPHORYLATION

<220>  
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<223> Xaa = any amino acid

<400> 28

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Xaa | Xaa | Xaa | Xaa | Ser | Thr | Xaa | Xaa | Xaa | Xaa | Ala | Lys | Lys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |

<210> 29  
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 <213> Artificial Sequence

<220>  
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<220>  
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<220>  
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 <223> Xaa = any amino acid

<400> 29

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Xaa | Xaa | Xaa | Xaa | Ser | Ser | Xaa | Xaa | Xaa | Xaa | Ala | Lys | Lys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |

<210> 30  
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<223> Xaa can be any naturally occurring amino acid

<220>

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<222> (13)..(16)

<223> Xaa can be any naturally occurring amino acid

<400> 30

Xaa Gly Xaa Gly Gly Ala Xaa Xaa Xaa Xaa Thr Pro Xaa Xaa Xaa Xaa  
1 5 10 15

Ala Lys Lys Lys  
20

<210> 31

<211> 20

<212> PRT

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<223> Xaa can be any naturally occurring amino acid

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<222> (13)..(16)

<223> Xaa can be any naturally occurring amino acid

<400> 31

Xaa Gly Xaa Gly Gly Ala Xaa Xaa Xaa Xaa Thr Pro Xaa Xaa Xaa Xaa  
1 5 10 15

Ala Lys Lys Lys  
20

<210> 32

<211> 20  
<212> PRT  
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<220>  
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<222> (12)..(16)  
<223> Xaa can be any naturally occurring amino acid

<400> 32

Xaa Gly Xaa Gly Gly Ala Xaa Xaa Xaa Xaa Thr Xaa Xaa Xaa Xaa Xaa  
1 5 10 15

Ala Lys Lys Lys  
20

<210> 33  
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 <223> Xaa can be any naturally occurring amino acid

<400> 33

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Xaa | Gly | Xaa | Gly | Gly | Ala | Xaa | Xaa | Xaa | Xaa | Thr | Xaa | Xaa | Xaa | Xaa | Xaa |
| 1   |     |     | 5   |     |     |     |     | 10  |     |     |     |     |     | 15  |     |

|     |     |     |     |
|-----|-----|-----|-----|
| Ala | Lys | Lys | Lys |
|     |     |     | 20  |

<210> 34  
 <211> 15  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> synthetic

<400> 34

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Gly | Pro | Met | Gln | Ser | Thr | Pro | Leu | Asn | Gly | Ala | Lys | Lys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |

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 <212> PRT  
 <213> Artificial Sequence

<220>  
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 <223> Xaa can be any naturally occurring amino acid

<400> 35

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Xaa | Gly | Xaa | Gly | Gly | Ala | Xaa | Xaa | Xaa | Xaa | Xaa | Gln | Xaa | Xaa | Xaa | Xaa |
| 1   |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |     |

|     |     |     |     |
|-----|-----|-----|-----|
| Ala | Lys | Lys | Lys |
|     |     |     | 20  |

<210> 36  
 <211> 20  
 <212> PRT  
 <213> Artificial Sequence

<220>  
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<220>  
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 <222> (7)..(10)  
 <223> Xaa can be any naturally occurring amino acid

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 <222> (12)..(16)  
 <223> Xaa can be any naturally occurring amino acid

<400> 36

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Xaa | Gly | Xaa | Gly | Gly | Ala | Xaa | Xaa | Xaa | Xaa | Ser | Xaa | Xaa | Xaa | Xaa | Xaa |
| 1   |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |     |

|     |     |     |     |
|-----|-----|-----|-----|
| Ala | Lys | Lys | Lys |
|     |     |     | 20  |

<210> 37  
 <211> 2089

<212> PRT  
<213> Homo sapiens

<400> 37

Met Glu Asp Thr Gln Ala Ile Asp Trp Asp Val Glu Glu Glu Glu Glu  
1 5 10 15

Thr Glu Gln Ser Ser Glu Ser Leu Arg Cys Asn Val Glu Pro Val Gly  
20 25 30

Arg Leu His Ile Phe Ser Gly Ala His Gly Pro Glu Lys Asp Phe Pro  
35 40 45

Leu His Leu Gly Lys Asn Val Val Gly Arg Met Pro Asp Cys Ser Val  
50 55 60

Ala Leu Pro Phe Pro Ser Ile Ser Lys Gln His Ala Glu Ile Glu Ile  
65 70 75 80

Leu Ala Trp Asp Lys Ala Pro Ile Leu Arg Asp Cys Gly Ser Leu Asn  
85 90 95

Gly Thr Gln Ile Leu Arg Pro Pro Lys Val Leu Ser Pro Gly Val Ser  
100 105 110

His Arg Leu Arg Asp Gln Glu Leu Ile Leu Phe Ala Asp Leu Leu Cys  
115 120 125

Gln Tyr His Arg Leu Asp Val Ser Leu Pro Phe Val Ser Arg Gly Pro  
130 135 140

Leu Thr Val Glu Glu Thr Pro Arg Val Gln Gly Glu Thr Gln Pro Gln  
145 150 155 160

Arg Leu Leu Leu Ala Glu Asp Ser Glu Glu Glu Val Asp Phe Leu Ser  
165 170 175

Glu Arg Arg Met Val Lys Lys Ser Arg Thr Thr Ser Ser Ser Val Ile  
180 185 190

Val Pro Glu Ser Asp Glu Glu Gly His Ser Pro Val Leu Gly Gly Leu  
195 200 205

Gly Pro Pro Phe Ala Phe Asn Leu Asn Ser Asp Thr Asp Val Glu Glu  
 210 215 220

Gly Gln Gln Pro Ala Thr Glu Glu Ala Ser Ser Ala Ala Arg Arg Gly  
 225 230 235 240

Ala Thr Val Glu Ala Lys Gln Ser Glu Ala Glu Val Val Thr Glu Ile  
 245 250 255

Gln Leu Glu Lys Asp Gln Pro Leu Val Lys Glu Arg Asp Asn Asp Thr  
 260 265 270

Lys Val Lys Arg Gly Ala Gly Asn Gly Val Val Pro Ala Gly Val Ile  
 275 280 285

Leu Glu Arg Ser Gln Pro Pro Gly Glu Asp Ser Asp Thr Asp Val Asp  
 290 295 300

Asp Asp Ser Arg Pro Pro Gly Arg Pro Ala Glu Val His Leu Glu Arg  
 305 310 315 320

Ala Gln Pro Phe Gly Phe Ile Asp Ser Asp Thr Asp Ala Glu Glu Glu  
 325 330 335

Arg Ile Pro Ala Thr Pro Val Val Ile Pro Met Lys Lys Arg Lys Ile  
 340 345 350

Phe His Gly Val Gly Thr Arg Gly Pro Gly Ala Pro Gly Leu Ala His  
 355 360 365

Leu Gln Glu Ser Gln Ala Gly Ser Asp Thr Asp Val Glu Glu Gly Lys  
 370 375 380

Ala Pro Gln Ala Val Pro Leu Glu Lys Ser Gln Ala Ser Met Val Ile  
 385 390 395 400

Asn Ser Asp Thr Asp Asp Glu Glu Glu Val Ser Ala Ala Leu Thr Leu  
 405 410 415

Ala His Leu Lys Glu Ser Gln Pro Ala Ile Trp Asn Arg Asp Ala Glu  
 420 425 430

Glu Asp Met Pro Gln Arg Val Val Leu Leu Gln Arg Ser Gln Thr Thr

|                         |                     |                     |
|-------------------------|---------------------|---------------------|
| 435                     | 440                 | 445                 |
| Thr Glu Arg Asp Ser Asp | Thr Asp Val Glu Glu | Glu Glu Leu Pro Val |
| 450                     | 455                 | 460                 |
| Glu Asn Arg Glu Ala Val | Leu Lys Asp His Thr | Lys Ile Arg Ala Leu |
| 465                     | 470                 | 475 480             |
| Val Arg Ala His Ser Glu | Lys Asp Gln Pro Pro | Phe Gly Asp Ser Asp |
| 485                     | 490                 | 495                 |
| Asp Ser Val Glu Ala Asp | Lys Ser Ser Pro Gly | Ile His Leu Glu Arg |
| 500                     | 505                 | 510                 |
| Ser Gln Ala Ser Thr Thr | Val Asp Ile Asn Thr | Gln Val Glu Lys Glu |
| 515                     | 520                 | 525                 |
| Val Pro Pro Gly Ser Ala | Ile Met His Ile Lys | Lys His Gln Val Ser |
| 530                     | 535                 | 540                 |
| Val Glu Gly Thr Asn Gln | Thr Asp Val Lys Ala | Val Gly Gly Pro Ala |
| 545                     | 550                 | 555 560             |
| Lys Leu Leu Val Val Ser | Leu Glu Glu Ala Trp | Pro Leu His Gly Asp |
| 565                     | 570                 | 575                 |
| Cys Glu Thr Asp Ala Glu | Glu Gly Thr Ser Leu | Thr Ala Ser Val Val |
| 580                     | 585                 | 590                 |
| Ala Asp Val Arg Lys Ser | Gln Leu Pro Ala Glu | Gly Asp Ala Gly Ala |
| 595                     | 600                 | 605                 |
| Glu Trp Ala Ala Ala Val | Leu Lys Gln Glu Arg | Ala His Glu Val Gly |
| 610                     | 615                 | 620                 |
| Ala Gln Gly Gly Pro Pro | Val Ala Gln Val Glu | Gln Asp Leu Pro Ile |
| 625                     | 630                 | 635 640             |
| Ser Arg Glu Asn Leu Thr | Asp Leu Val Val Asp | Thr Asp Thr Leu Gly |
| 645                     | 650                 | 655                 |
| Glu Ser Thr Gln Pro Gln | Arg Glu Gly Ala Gln | Val Pro Thr Gly Arg |
| 660                     | 665                 | 670                 |

Glu Arg Glu Gln His Val Gly Gly Thr Lys Asp Ser Glu Asp Asn Tyr  
675 680 685

Gly Asp Ser Glu Asp Leu Asp Leu Gln Ala Thr Gln Cys Phe Leu Glu  
690 695 700

Asn Gln Gly Leu Glu Ala Val Gln Ser Met Glu Asp Glu Pro Thr Gln  
705 710 715 720

Ala Phe Met Leu Thr Pro Pro Gln Glu Leu Gly Pro Ser His Cys Ser  
725 730 735

Phe Gln Thr Thr Gly Thr Leu Asp Glu Pro Trp Glu Val Leu Ala Thr  
740 745 750

Gln Pro Phe Cys Leu Arg Glu Ser Glu Asp Ser Glu Thr Gln Pro Phe  
755 760 765

Asp Thr His Leu Glu Ala Tyr Gly Pro Cys Leu Ser Pro Pro Arg Ala  
770 775 780

Ile Pro Gly Asp Gln His Pro Glu Ser Pro Val His Thr Glu Pro Met  
785 790 795 800

Gly Ile Gln Gly Arg Gly Arg Gln Thr Val Asp Lys Val Met Gly Ile  
805 810 815

Pro Lys Glu Thr Ala Glu Arg Val Gly Pro Glu Arg Gly Pro Leu Glu  
820 825 830

Arg Glu Thr Glu Lys Leu Leu Pro Glu Arg Gln Thr Asp Val Thr Gly  
835 840 845

Glu Glu Glu Leu Thr Lys Gly Lys Gln Asp Arg Glu Gln Lys Gln Leu  
850 855 860

Leu Ala Arg Asp Thr Gln Arg Gln Glu Ser Asp Lys Asn Gly Glu Ser  
865 870 875 880

Ala Ser Pro Glu Arg Asp Arg Glu Ser Leu Lys Val Glu Ile Glu Thr  
885 890 895



Ser Glu Glu Ile Gln Glu Lys Gln Val Gln Lys Gln Thr Leu Pro Ser  
900 905 910

Lys Ala Phe Glu Arg Glu Val Glu Arg Pro Val Ala Asn Arg Glu Cys  
915 920 925

Asp Pro Ala Glu Leu Glu Glu Lys Val Pro Lys Val Ile Leu Glu Arg  
930 935 940

Asp Thr Gln Arg Gly Glu Pro Glu Gly Gly Ser Gln Asp Gln Lys Gly  
945 950 955 960

Gln Ala Ser Ser Pro Thr Pro Glu Pro Gly Val Gly Ala Gly Asp Leu  
965 970 975

Pro Gly Pro Thr Ser Ala Pro Val Pro Ser Gly Ser Gln Ser Gly Gly  
980 985 990

Arg Gly Ser Pro Val Ser Pro Arg Arg His Gln Lys Gly Leu Leu Asn  
995 1000 1005

Cys Lys Met Pro Pro Ala Glu Lys Ala Ser Arg Ile Arg Ala Ala  
1010 1015 1020

Glu Lys Val Ser Arg Gly Asp Gln Glu Ser Pro Asp Ala Cys Leu  
1025 1030 1035

Pro Pro Ala Val Pro Glu Ala Pro Ala Pro Pro Gln Lys Pro Leu  
1040 1045 1050

Asn Ser Gln Ser Gln Lys His Leu Ala Pro Pro Pro Leu Leu Ser  
1055 1060 1065

Pro Leu Leu Pro Ser Ile Lys Pro Thr Val Arg Lys Thr Arg Gln  
1070 1075 1080

Asp Gly Ser Gln Glu Ala Pro Glu Ala Pro Leu Ser Ser Glu Leu  
1085 1090 1095

Glu Pro Phe His Pro Lys Pro Lys Ile Arg Thr Arg Lys Ser Ser  
1100 1105 1110

|         |                 |                     |                 |
|---------|-----------------|---------------------|-----------------|
| Arg Met | Thr Pro Phe Pro | Ala Thr Ser Ala Ala | Pro Glu Pro His |
| 1115    |                 | 1120                | 1125            |
| Pro Ser | Thr Ser Thr Ala | Gln Pro Val Thr Pro | Lys Pro Thr Ser |
| 1130    |                 | 1135                | 1140            |
| Gln Ala | Thr Arg Ser Arg | Thr Asn Arg Ser Ser | Val Lys Thr Pro |
| 1145    |                 | 1150                | 1155            |
| Glu Pro | Val Val Pro Thr | Ala Pro Glu Leu Gln | Pro Ser Thr Ser |
| 1160    |                 | 1165                | 1170            |
| Thr Asp | Gln Pro Val Thr | Ser Glu Pro Thr Ser | Gln Val Thr Arg |
| 1175    |                 | 1180                | 1185            |
| Gly Arg | Lys Ser Arg Ser | Ser Val Lys Thr Pro | Glu Thr Val Val |
| 1190    |                 | 1195                | 1200            |
| Pro Thr | Ala Leu Glu Leu | Gln Pro Ser Thr Ser | Thr Asp Arg Pro |
| 1205    |                 | 1210                | 1215            |
| Val Thr | Ser Glu Pro Thr | Ser Gln Ala Thr Arg | Gly Arg Lys Asn |
| 1220    |                 | 1225                | 1230            |
| Arg Ser | Ser Val Lys Thr | Pro Glu Pro Val Val | Pro Thr Ala Pro |
| 1235    |                 | 1240                | 1245            |
| Glu Leu | Gln Pro Ser Thr | Ser Thr Asp Gln Pro | Val Thr Ser Glu |
| 1250    |                 | 1255                | 1260            |
| Pro Thr | Tyr Gln Ala Thr | Arg Gly Arg Lys Asn | Arg Ser Ser Val |
| 1265    |                 | 1270                | 1275            |
| Lys Thr | Pro Glu Pro Val | Val Pro Thr Ala Pro | Glu Leu Arg Pro |
| 1280    |                 | 1285                | 1290            |
| Ser Thr | Ser Thr Asp Arg | Pro Val Thr Pro Lys | Pro Thr Ser Arg |
| 1295    |                 | 1300                | 1305            |
| Thr Thr | Arg Ser Arg Thr | Asn Met Ser Ser Val | Lys Thr Pro Glu |
| 1310    |                 | 1315                | 1320            |
| Thr Val | Val Pro Thr Ala | Pro Glu Leu Gln Ile | Ser Thr Ser Thr |

|                             |                                 |      |  |      |
|-----------------------------|---------------------------------|------|--|------|
| 1325                        |                                 | 1330 |  | 1335 |
| Asp Gln Pro Val Thr Pro Lys | Pro Thr Ser Arg Thr Thr Arg Ser |      |  |      |
| 1340                        | 1345                            | 1350 |  |      |
| Arg Thr Asn Met Ser Ser Val | Lys Asn Pro Glu Ser Thr Val Pro |      |  |      |
| 1355                        | 1360                            | 1365 |  |      |
| Ile Ala Pro Glu Leu Pro Pro | Ser Thr Ser Thr Glu Gln Pro Val |      |  |      |
| 1370                        | 1375                            | 1380 |  |      |
| Thr Pro Glu Pro Thr Ser Arg | Ala Thr Arg Gly Arg Lys Asn Arg |      |  |      |
| 1385                        | 1390                            | 1395 |  |      |
| Ser Ser Gly Lys Thr Pro Glu | Thr Leu Val Pro Thr Ala Pro Lys |      |  |      |
| 1400                        | 1405                            | 1410 |  |      |
| Leu Glu Pro Ser Thr Ser Thr | Asp Gln Pro Val Thr Pro Glu Pro |      |  |      |
| 1415                        | 1420                            | 1425 |  |      |
| Thr Ser Gln Ala Thr Arg Gly | Arg Thr Asn Arg Ser Ser Val Lys |      |  |      |
| 1430                        | 1435                            | 1440 |  |      |
| Thr Pro Glu Thr Val Val Pro | Thr Ala Pro Glu Leu Gln Pro Ser |      |  |      |
| 1445                        | 1450                            | 1455 |  |      |
| Thr Ser Thr Asp Gln Pro Val | Thr Pro Glu Pro Thr Ser Gln Ala |      |  |      |
| 1460                        | 1465                            | 1470 |  |      |
| Thr Arg Gly Arg Thr Asp Arg | Ser Ser Val Lys Thr Pro Glu Thr |      |  |      |
| 1475                        | 1480                            | 1485 |  |      |
| Val Val Pro Thr Ala Pro Glu | Leu Gln Ala Ser Ala Ser Thr Asp |      |  |      |
| 1490                        | 1495                            | 1500 |  |      |
| Gln Pro Val Thr Ser Glu Pro | Thr Ser Arg Thr Thr Arg Gly Arg |      |  |      |
| 1505                        | 1510                            | 1515 |  |      |
| Lys Asn Arg Ser Ser Val Lys | Thr Pro Glu Thr Val Val Pro Ala |      |  |      |
| 1520                        | 1525                            | 1530 |  |      |
| Ala Pro Glu Leu Gln Pro Pro | Thr Ser Thr Asp Arg Pro Val Thr |      |  |      |
| 1535                        | 1540                            | 1545 |  |      |

|         |                 |      |                 |      |             |
|---------|-----------------|------|-----------------|------|-------------|
| Pro Glu | Pro Thr Ser Arg | Ala  | Thr Arg Gly Arg | Thr  | Asn Arg Ser |
| 1550    |                 | 1555 |                 | 1560 |             |
| Ser Val | Lys Thr Pro Glu | Ser  | Ile Val Pro Ile | Ala  | Pro Glu Leu |
| 1565    |                 | 1570 |                 | 1575 |             |
| Gln Pro | Ser Thr Ser Arg | Asn  | Gln Leu Val Thr | Pro  | Glu Pro Thr |
| 1580    |                 | 1585 |                 | 1590 |             |
| Ser Arg | Ala Thr Arg Cys | Arg  | Thr Asn Arg Ser | Ser  | Val Lys Thr |
| 1595    |                 | 1600 |                 | 1605 |             |
| Pro Glu | Pro Val Val Pro | Thr  | Ala Pro Glu Pro | His  | Pro Thr Thr |
| 1610    |                 | 1615 |                 | 1620 |             |
| Ser Thr | Asp Gln Pro Val | Thr  | Pro Lys Leu Thr | Ser  | Arg Ala Thr |
| 1625    |                 | 1630 |                 | 1635 |             |
| Arg Arg | Lys Thr Asn Arg | Ser  | Ser Val Lys Thr | Pro  | Lys Pro Val |
| 1640    |                 | 1645 |                 | 1650 |             |
| Glu Pro | Ala Ala Ser Asp | Leu  | Glu Pro Phe Thr | Pro  | Thr Asp Gln |
| 1655    |                 | 1660 |                 | 1665 |             |
| Ser Val | Thr Pro Glu Ala | Ile  | Ala Gln Gly Gly | Gln  | Ser Lys Thr |
| 1670    |                 | 1675 |                 | 1680 |             |
| Leu Arg | Ser Ser Thr Val | Arg  | Ala Met Pro Val | Pro  | Thr Thr Pro |
| 1685    |                 | 1690 |                 | 1695 |             |
| Glu Phe | Gln Ser Pro Val | Thr  | Thr Asp Gln Pro | Ile  | Ser Pro Glu |
| 1700    |                 | 1705 |                 | 1710 |             |
| Pro Ile | Thr Gln Pro Ser | Cys  | Ile Lys Arg Gln | Arg  | Ala Ala Gly |
| 1715    |                 | 1720 |                 | 1725 |             |
| Asn Pro | Gly Ser Leu Ala | Ala  | Pro Ile Asp His | Lys  | Pro Cys Ser |
| 1730    |                 | 1735 |                 | 1740 |             |
| Ala Pro | Leu Glu Pro Lys | Ser  | Gln Ala Ser Arg | Asn  | Gln Arg Trp |
| 1745    |                 | 1750 |                 | 1755 |             |

|      |     |     |     |     |     |      |     |     |     |     |      |     |     |     |
|------|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|
| Gly  | Ala | Val | Arg | Ala | Ala | Glu  | Ser | Leu | Thr | Ala | Ile  | Pro | Glu | Pro |
| 1760 |     |     |     |     |     | 1765 |     |     |     |     | 1770 |     |     |     |
| Ala  | Ser | Pro | Gln | Leu | Leu | Glu  | Thr | Pro | Ile | His | Ala  | Ser | Gln | Ile |
| 1775 |     |     |     |     |     | 1780 |     |     |     |     | 1785 |     |     |     |
| Gln  | Lys | Val | Glu | Pro | Ala | Gly  | Arg | Ser | Arg | Phe | Thr  | Pro | Glu | Leu |
| 1790 |     |     |     |     |     | 1795 |     |     |     |     | 1800 |     |     |     |
| Gln  | Pro | Lys | Ala | Ser | Gln | Ser  | Arg | Lys | Arg | Ser | Leu  | Ala | Thr | Met |
| 1805 |     |     |     |     |     | 1810 |     |     |     |     | 1815 |     |     |     |
| Asp  | Ser | Pro | Pro | His | Gln | Lys  | Gln | Pro | Gln | Arg | Gly  | Glu | Val | Ser |
| 1820 |     |     |     |     |     | 1825 |     |     |     |     | 1830 |     |     |     |
| Gln  | Lys | Thr | Val | Ile | Ile | Lys  | Glu | Glu | Glu | Glu | Asp  | Thr | Ala | Glu |
| 1835 |     |     |     |     |     | 1840 |     |     |     |     | 1845 |     |     |     |
| Lys  | Pro | Gly | Lys | Glu | Glu | Asp  | Val | Val | Thr | Pro | Lys  | Pro | Gly | Lys |
| 1850 |     |     |     |     |     | 1855 |     |     |     |     | 1860 |     |     |     |
| Arg  | Lys | Arg | Asp | Gln | Ala | Glu  | Glu | Glu | Pro | Asn | Arg  | Ile | Pro | Ser |
| 1865 |     |     |     |     |     | 1870 |     |     |     |     | 1875 |     |     |     |
| Arg  | Ser | Leu | Arg | Arg | Thr | Lys  | Leu | Asn | Gln | Glu | Ser  | Thr | Ala | Pro |
| 1880 |     |     |     |     |     | 1885 |     |     |     |     | 1890 |     |     |     |
| Lys  | Val | Leu | Phe | Thr | Gly | Val  | Val | Asp | Ala | Arg | Gly  | Glu | Arg | Ala |
| 1895 |     |     |     |     |     | 1900 |     |     |     |     | 1905 |     |     |     |
| Val  | Leu | Ala | Leu | Gly | Gly | Ser  | Leu | Ala | Gly | Ser | Ala  | Ala | Glu | Ala |
| 1910 |     |     |     |     |     | 1915 |     |     |     |     | 1920 |     |     |     |
| Ser  | His | Leu | Val | Thr | Asp | Arg  | Ile | Arg | Arg | Thr | Val  | Lys | Phe | Leu |
| 1925 |     |     |     |     |     | 1930 |     |     |     |     | 1935 |     |     |     |
| Cys  | Ala | Leu | Gly | Arg | Gly | Ile  | Pro | Ile | Leu | Ser | Leu  | Asp | Trp | Leu |
| 1940 |     |     |     |     |     | 1945 |     |     |     |     | 1950 |     |     |     |
| His  | Gln | Ser | Arg | Lys | Ala | Gly  | Phe | Phe | Leu | Pro | Pro  | Asp | Glu | Tyr |
| 1955 |     |     |     |     |     | 1960 |     |     |     |     | 1965 |     |     |     |

Val Val Thr Asp Pro Glu Gln Glu Lys Asn Phe Gly Phe Ser Leu  
1970 1975 1980

Gln Asp Ala Leu Ser Arg Ala Arg Glu Arg Arg Leu Leu Glu Gly  
1985 1990 1995

Tyr Glu Ile Tyr Val Thr Pro Gly Val Gln Pro Pro Pro Pro Gln  
2000 2005 2010

Met Gly Glu Ile Ile Ser Cys Cys Gly Gly Thr Tyr Leu Pro Ser  
2015 2020 2025

Met Pro Arg Ser Tyr Lys Pro Gln Arg Val Val Ile Thr Cys Pro  
2030 2035 2040

Gln Asp Phe Pro His Cys Ser Ile Pro Leu Arg Val Gly Leu Pro  
2045 2050 2055

Leu Leu Ser Pro Glu Phe Leu Leu Thr Gly Val Leu Lys Gln Glu  
2060 2065 2070

Ala Lys Pro Glu Ala Phe Val Leu Ser Pro Leu Glu Met Ser Ser  
2075 2080 2085

Thr

<210> 38  
<211> 1972  
<212> PRT  
<213> Homo sapiens

<400> 38

Met Asp Pro Thr Gly Ser Gln Leu Asp Ser Asp Phe Ser Gln Gln Asp  
1 5 10 15

Thr Pro Cys Leu Ile Ile Glu Asp Ser Gln Pro Glu Ser Gln Val Leu  
20 25 30

Glu Asp Asp Ser Gly Ser His Phe Ser Met Leu Ser Arg His Leu Pro  
35 40 45

Asn Leu Gln Thr His Lys Glu Asn Pro Val Leu Asp Val Val Ser Asn  
50 55 60

Pro Glu Gln Thr Ala Gly Glu Glu Arg Gly Asp Gly Asn Ser Gly Phe  
65 70 75 80

Asn Glu His Leu Lys Glu Asn Lys Val Ala Asp Pro Val Asp Ser Ser  
85 90 95

Asn Leu Asp Thr Cys Gly Ser Ile Ser Gln Val Ile Glu Gln Leu Pro  
100 105 110

Gln Pro Asn Arg Thr Ser Ser Val Leu Gly Met Ser Val Glu Ser Ala  
115 120 125

Pro Ala Val Glu Glu Glu Lys Gly Glu Glu Leu Glu Gln Lys Glu Lys  
130 135 140

Glu Lys Glu Glu Asp Thr Ser Gly Asn Thr Thr His Ser Leu Gly Ala  
145 150 155 160

Glu Asp Thr Ala Ser Ser Gln Leu Gly Phe Gly Val Leu Glu Leu Ser  
165 170 175

Gln Ser Gln Asp Val Glu Glu Asn Thr Val Pro Tyr Glu Val Asp Lys  
180 185 190

Glu Gln Leu Gln Ser Val Thr Thr Asn Ser Gly Tyr Thr Arg Leu Ser  
195 200 205

Asp Val Asp Ala Asn Thr Ala Ile Lys His Glu Glu Gln Ser Asn Glu  
210 215 220

Asp Ile Pro Ile Ala Glu Gln Ser Ser Lys Asp Ile Pro Val Thr Ala  
225 230 235 240

Gln Pro Ser Lys Asp Val His Val Val Lys Glu Gln Asn Pro Pro Pro  
245 250 255

Ala Arg Ser Glu Asp Met Pro Phe Ser Pro Lys Ala Ser Val Ala Ala  
260 265 270

Met Glu Ala Lys Glu Gln Leu Ser Ala Gln Glu Leu Met Glu Ser Gly  
275 280 285

Leu Gln Ile Gln Lys Ser Pro Glu Pro Glu Val Leu Ser Thr Gln Glu  
 290 295 300

Asp Leu Phe Asp Gln Ser Asn Lys Thr Val Ser Ser Asp Gly Cys Ser  
 305 310 315 320

Thr Pro Ser Arg Glu Glu Gly Gly Cys Ser Leu Ala Ser Thr Pro Ala  
 325 330 335

Thr Thr Leu His Leu Leu Gln Leu Ser Gly Gln Arg Ser Leu Val Gln  
 340 345 350

Asp Ser Leu Ser Thr Asn Ser Ser Asp Leu Val Ala Pro Ser Pro Asp  
 355 360 365

Ala Phe Arg Ser Thr Pro Phe Ile Val Pro Ser Ser Pro Thr Glu Gln  
 370 375 380

Glu Gly Arg Gln Asp Lys Pro Met Asp Thr Ser Val Leu Ser Glu Glu  
 385 390 395 400

Gly Gly Glu Pro Phe Gln Lys Lys Leu Gln Ser Gly Glu Pro Val Glu  
 405 410 415

Leu Glu Asn Pro Pro Leu Leu Pro Glu Ser Thr Val Ser Pro Gln Ala  
 420 425 430

Ser Thr Pro Ile Ser Gln Ser Thr Pro Val Phe Pro Pro Gly Ser Leu  
 435 440 445

Pro Ile Pro Ser Gln Pro Gln Phe Ser His Asp Ile Phe Ile Pro Ser  
 450 455 460

Pro Ser Leu Glu Glu Gln Ser Asn Asp Gly Lys Lys Asp Gly Asp Met  
 465 470 475 480

His Ser Ser Ser Leu Thr Val Glu Cys Ser Lys Thr Ser Glu Ile Glu  
 485 490 495

Pro Lys Asn Ser Pro Glu Asp Leu Gly Leu Ser Leu Thr Gly Asp Ser  
 500 505 510



Cys Lys Leu Met Leu Ser Thr Ser Glu Tyr Ser Gln Ser Pro Lys Met  
515 520 525

Glu Ser Leu Ser Ser His Arg Ile Asp Glu Asp Gly Glu Asn Thr Gln  
530 535 540

Ile Glu Asp Thr Glu Pro Met Ser Pro Val Leu Asn Ser Lys Phe Val  
545 550 555 560

Pro Ala Glu Asn Asp Ser Ile Leu Met Asn Pro Ala Gln Asp Gly Glu  
565 570 575

Val Gln Leu Ser Gln Asn Asp Asp Lys Thr Lys Gly Asp Asp Thr Asp  
580 585 590

Thr Arg Asp Asp Ile Ser Ile Leu Ala Thr Gly Cys Lys Gly Arg Glu  
595 600 605

Glu Thr Val Ala Glu Asp Val Cys Ile Asp Leu Thr Cys Asp Ser Gly  
610 615 620

Ser Gln Ala Val Pro Ser Pro Ala Thr Arg Ser Glu Ala Leu Ser Ser  
625 630 635 640

Val Leu Asp Gln Glu Glu Ala Met Glu Ile Lys Glu His His Pro Glu  
645 650 655

Glu Gly Ser Ser Gly Ser Glu Val Glu Glu Ile Pro Glu Thr Pro Cys  
660 665 670

Glu Ser Gln Gly Glu Glu Leu Lys Glu Glu Asn Met Glu Ser Val Pro  
675 680 685

Leu His Leu Ser Leu Thr Glu Thr Gln Ser Gln Gly Leu Cys Leu Gln  
690 695 700

Lys Glu Met Pro Lys Lys Glu Cys Ser Glu Ala Met Glu Val Glu Thr  
705 710 715 720

Ser Val Ile Ser Ile Asp Ser Pro Gln Lys Leu Ala Ile Leu Asp Gln  
725 730 735

Glu Leu Glu His Lys Glu Gln Glu Ala Trp Glu Glu Ala Thr Ser Glu

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 740 |     |     |     |     |     |     |     | 745 |     |     |     |     |     |     | 750 |
| Asp | Ser | Ser | Val | Val | Ile | Val | Asp | Val | Lys | Glu | Pro | Ser | Pro | Arg | Val |
|     | 755 |     |     |     |     |     | 760 |     |     |     |     | 765 |     |     |     |
| Asp | Val | Ser | Cys | Glu | Pro | Leu | Glu | Gly | Val | Glu | Lys | Cys | Ser | Asp | Ser |
|     | 770 |     |     |     |     | 775 |     |     |     |     | 780 |     |     |     |     |
| Gln | Ser | Trp | Glu | Asp | Ile | Ala | Pro | Glu | Ile | Glu | Pro | Cys | Ala | Glu | Asn |
| 785 |     |     |     |     | 790 |     |     |     |     | 795 |     |     |     |     | 800 |
| Arg | Leu | Asp | Thr | Lys | Glu | Glu | Lys | Ser | Val | Glu | Tyr | Glu | Gly | Asp | Leu |
|     |     |     |     | 805 |     |     |     |     | 810 |     |     |     |     | 815 |     |
| Lys | Ser | Gly | Thr | Ala | Glu | Thr | Glu | Pro | Val | Glu | Gln | Asp | Ser | Ser | Gln |
|     |     |     | 820 |     |     |     |     | 825 |     |     |     |     | 830 |     |     |
| Pro | Ser | Leu | Pro | Leu | Val | Arg | Ala | Asp | Asp | Pro | Leu | Arg | Leu | Asp | Gln |
|     |     | 835 |     |     |     |     | 840 |     |     |     |     | 845 |     |     |     |
| Glu | Leu | Gln | Gln | Pro | Gln | Thr | Gln | Glu | Lys | Thr | Ser | Asn | Ser | Leu | Thr |
|     | 850 |     |     |     |     | 855 |     |     |     |     | 860 |     |     |     |     |
| Glu | Asp | Ser | Lys | Met | Ala | Asn | Ala | Lys | Gln | Leu | Ser | Ser | Asp | Ala | Glu |
| 865 |     |     |     |     | 870 |     |     |     |     | 875 |     |     |     |     | 880 |
| Ala | Gln | Lys | Leu | Gly | Lys | Pro | Ser | Ala | His | Ala | Ser | Gln | Ser | Phe | Cys |
|     |     |     |     | 885 |     |     |     |     | 890 |     |     |     |     | 895 |     |
| Glu | Ser | Ser | Ser | Glu | Thr | Pro | Phe | His | Phe | Thr | Leu | Pro | Lys | Glu | Gly |
|     |     |     | 900 |     |     |     |     | 905 |     |     |     |     | 910 |     |     |
| Asp | Ile | Ile | Pro | Pro | Leu | Thr | Gly | Ala | Thr | Pro | Pro | Leu | Ile | Gly | His |
|     | 915 |     |     |     |     |     | 920 |     |     |     |     | 925 |     |     |     |
| Leu | Lys | Leu | Glu | Pro | Lys | Arg | His | Ser | Thr | Pro | Ile | Gly | Ile | Ser | Asn |
|     | 930 |     |     |     |     | 935 |     |     |     |     | 940 |     |     |     |     |
| Tyr | Pro | Glu | Ser | Thr | Ile | Ala | Thr | Ser | Asp | Val | Met | Ser | Glu | Ser | Met |
| 945 |     |     |     |     | 950 |     |     |     |     | 955 |     |     |     |     | 960 |
| Val | Glu | Thr | His | Asp | Pro | Ile | Leu | Gly | Ser | Gly | Lys | Gly | Asp | Ser | Gly |
|     |     |     |     | 965 |     |     |     |     | 970 |     |     |     |     | 975 |     |

Ala Ala Pro Asp Val Asp Asp Lys Leu Cys Leu Arg Met Lys Leu Val  
980 985 990

Ser Pro Glu Thr Glu Ala Ser Glu Glu Ser Leu Gln Phe Asn Leu Glu  
995 1000 1005

Lys Pro Ala Thr Gly Glu Arg Lys Asn Gly Ser Thr Ala Val Ala  
1010 1015 1020

Glu Ser Val Ala Ser Pro Gln Lys Thr Met Ser Val Leu Ser Cys  
1025 1030 1035

Ile Cys Glu Ala Arg Gln Glu Asn Glu Ala Arg Ser Glu Asp Pro  
1040 1045 1050

Pro Thr Thr Pro Ile Arg Gly Asn Leu Leu His Phe Pro Ser Ser  
1055 1060 1065

Gln Gly Glu Glu Glu Lys Glu Lys Leu Glu Gly Asp His Thr Ile  
1070 1075 1080

Arg Gln Ser Gln Gln Pro Met Lys Pro Ile Ser Pro Val Lys Asp  
1085 1090 1095

Pro Val Ser Pro Ala Ser Gln Lys Met Val Ile Gln Gly Pro Ser  
1100 1105 1110

Ser Pro Gln Gly Glu Ala Met Val Thr Asp Val Leu Glu Asp Gln  
1115 1120 1125

Lys Glu Gly Arg Ser Thr Asn Lys Glu Asn Pro Ser Lys Ala Leu  
1130 1135 1140

Ile Glu Arg Pro Ser Gln Asn Asn Ile Gly Ile Gln Thr Met Glu  
1145 1150 1155

Cys Ser Leu Arg Val Pro Glu Thr Val Ser Ala Ala Thr Gln Thr  
1160 1165 1170

Ile Lys Asn Val Cys Glu Gln Gly Thr Ser Thr Val Asp Gln Asn  
1175 1180 1185

|         |                     |                     |             |
|---------|---------------------|---------------------|-------------|
| Phe Gly | Lys Gln Asp Ala Thr | Val Gln Thr Glu Arg | Gly Ser Gly |
| 1190    | 1195                | 1200                |             |
| Glu Lys | Pro Val Ser Ala Pro | Gly Asp Asp Thr Glu | Ser Leu His |
| 1205    | 1210                | 1215                |             |
| Ser Gln | Gly Glu Glu Glu Phe | Asp Met Pro Gln Pro | Pro His Gly |
| 1220    | 1225                | 1230                |             |
| His Val | Leu His Arg His Met | Arg Thr Ile Arg Glu | Val Arg Thr |
| 1235    | 1240                | 1245                |             |
| Leu Val | Thr Arg Val Ile Thr | Asp Val Tyr Tyr Val | Asp Gly Thr |
| 1250    | 1255                | 1260                |             |
| Glu Val | Glu Arg Lys Val Thr | Glu Glu Thr Glu Glu | Pro Ile Val |
| 1265    | 1270                | 1275                |             |
| Glu Cys | Gln Glu Cys Glu Thr | Glu Val Ser Pro Ser | Gln Thr Gly |
| 1280    | 1285                | 1290                |             |
| Gly Ser | Ser Gly Asp Leu Gly | Asp Ile Ser Ser Phe | Ser Ser Lys |
| 1295    | 1300                | 1305                |             |
| Ala Ser | Ser Leu His Arg Thr | Ser Ser Gly Thr Ser | Leu Ser Ala |
| 1310    | 1315                | 1320                |             |
| Met His | Ser Ser Gly Ser Ser | Gly Lys Gly Ala Gly | Pro Leu Arg |
| 1325    | 1330                | 1335                |             |
| Gly Lys | Thr Ser Gly Thr Glu | Pro Ala Asp Phe Ala | Leu Pro Ser |
| 1340    | 1345                | 1350                |             |
| Ser Arg | Gly Gly Pro Gly Lys | Leu Ser Pro Arg Lys | Gly Val Ser |
| 1355    | 1360                | 1365                |             |
| Gln Thr | Gly Thr Pro Val Cys | Glu Glu Asp Gly Asp | Ala Gly Leu |
| 1370    | 1375                | 1380                |             |
| Gly Ile | Arg Gln Gly Gly Lys | Ala Pro Val Thr Pro | Arg Gly Arg |
| 1385    | 1390                | 1395                |             |

|      |     |     |     |     |     |      |     |     |     |     |      |     |     |     |
|------|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|
| Gly  | Arg | Arg | Gly | Arg | Pro | Pro  | Ser | Arg | Thr | Thr | Gly  | Thr | Arg | Glu |
| 1400 |     |     |     |     |     | 1405 |     |     |     |     | 1410 |     |     |     |
| Thr  | Ala | Val | Pro | Gly | Pro | Leu  | Gly | Ile | Glu | Asp | Ile  | Ser | Pro | Asn |
| 1415 |     |     |     |     |     | 1420 |     |     |     |     | 1425 |     |     |     |
| Leu  | Ser | Pro | Asp | Asp | Lys | Ser  | Phe | Ser | Arg | Val | Val  | Pro | Arg | Val |
| 1430 |     |     |     |     |     | 1435 |     |     |     |     | 1440 |     |     |     |
| Pro  | Asp | Ser | Thr | Arg | Arg | Thr  | Asp | Val | Gly | Ala | Gly  | Ala | Leu | Arg |
| 1445 |     |     |     |     |     | 1450 |     |     |     |     | 1455 |     |     |     |
| Arg  | Ser | Asp | Ser | Pro | Glu | Ile  | Pro | Phe | Gln | Ala | Ala  | Ala | Gly | Pro |
| 1460 |     |     |     |     |     | 1465 |     |     |     |     | 1470 |     |     |     |
| Ser  | Asp | Gly | Leu | Asp | Ala | Ser  | Ser | Pro | Gly | Asn | Ser  | Phe | Val | Gly |
| 1475 |     |     |     |     |     | 1480 |     |     |     |     | 1485 |     |     |     |
| Leu  | Arg | Val | Val | Ala | Lys | Trp  | Ser | Ser | Asn | Gly | Tyr  | Phe | Tyr | Ser |
| 1490 |     |     |     |     |     | 1495 |     |     |     |     | 1500 |     |     |     |
| Gly  | Lys | Ile | Thr | Arg | Asp | Val  | Gly | Ala | Gly | Lys | Tyr  | Lys | Leu | Leu |
| 1505 |     |     |     |     |     | 1510 |     |     |     |     | 1515 |     |     |     |
| Phe  | Asp | Asp | Gly | Tyr | Glu | Cys  | Asp | Val | Leu | Gly | Lys  | Asp | Ile | Leu |
| 1520 |     |     |     |     |     | 1525 |     |     |     |     | 1530 |     |     |     |
| Leu  | Cys | Asp | Pro | Ile | Pro | Leu  | Asp | Thr | Glu | Val | Thr  | Ala | Leu | Ser |
| 1535 |     |     |     |     |     | 1540 |     |     |     |     | 1545 |     |     |     |
| Glu  | Asp | Glu | Tyr | Phe | Ser | Ala  | Gly | Val | Val | Lys | Gly  | His | Arg | Lys |
| 1550 |     |     |     |     |     | 1555 |     |     |     |     | 1560 |     |     |     |
| Glu  | Ser | Gly | Glu | Leu | Tyr | Tyr  | Ser | Ile | Glu | Lys | Glu  | Gly | Gln | Arg |
| 1565 |     |     |     |     |     | 1570 |     |     |     |     | 1575 |     |     |     |
| Lys  | Trp | Tyr | Lys | Arg | Met | Ala  | Val | Ile | Leu | Ser | Leu  | Glu | Gln | Gly |
| 1580 |     |     |     |     |     | 1585 |     |     |     |     | 1590 |     |     |     |
| Asn  | Arg | Leu | Arg | Glu | Gln | Tyr  | Gly | Leu | Gly | Pro | Tyr  | Glu | Ala | Val |
| 1595 |     |     |     |     |     | 1600 |     |     |     |     | 1605 |     |     |     |
| Thr  | Pro | Leu | Thr | Lys | Ala | Ala  | Asp | Ile | Ser | Leu | Asp  | Asn | Leu | Val |

|   |      |      |      |      |
|---|------|------|------|------|
| 1610  |      | 1615 |      | 1620 |
| Glu Gly Lys Arg Lys Arg Arg Ser Asn Val Ser Ser Pro Ala Thr | 1625 | 1630 | 1635 |      |
| Pro Thr Ala Ser Ser Ser Ser Ser Thr Thr Pro Thr Arg Lys Ile | 1640 | 1645 | 1650 |      |
| Thr Glu Ser Pro Arg Ala Ser Met Gly Val Leu Ser Gly Lys Arg | 1655 | 1660 | 1665 |      |
| Lys Leu Ile Thr Ser Glu Glu Glu Arg Ser Pro Ala Lys Arg Gly | 1670 | 1675 | 1680 |      |
| Arg Lys Ser Ala Thr Val Lys Pro Gly Ala Val Gly Ala Gly Glu | 1685 | 1690 | 1695 |      |
| Phe Val Ser Pro Cys Glu Ser Gly Asp Asn Thr Gly Glu Pro Ser | 1700 | 1705 | 1710 |      |
| Ala Leu Glu Glu Gln Arg Gly Pro Leu Pro Leu Asn Lys Thr Leu | 1715 | 1720 | 1725 |      |
| Phe Leu Gly Tyr Ala Phe Leu Leu Thr Met Ala Thr Thr Ser Asp | 1730 | 1735 | 1740 |      |
| Lys Leu Ala Ser Arg Ser Lys Leu Pro Asp Gly Pro Thr Gly Ser | 1745 | 1750 | 1755 |      |
| Ser Glu Glu Glu Glu Glu Phe Leu Glu Ile Pro Pro Phe Asn Lys | 1760 | 1765 | 1770 |      |
| Gln Tyr Thr Glu Ser Gln Leu Arg Ala Gly Ala Gly Tyr Ile Leu | 1775 | 1780 | 1785 |      |
| Glu Asp Phe Asn Glu Ala Gln Cys Asn Thr Ala Tyr Gln Cys Leu | 1790 | 1795 | 1800 |      |
| Leu Ile Ala Asp Gln His Cys Arg Thr Arg Lys Tyr Phe Leu Cys | 1805 | 1810 | 1815 |      |
| Leu Ala Ser Gly Ile Pro Cys Val Ser His Val Trp Val His Asp | 1820 | 1825 | 1830 |      |

Ser Cys His Ala Asn Gln Leu Gln Asn Tyr Arg Asn Tyr Leu Leu  
 1835 1840 1845

Pro Ala Gly Tyr Ser Leu Glu Glu Gln Arg Ile Leu Asp Trp Gln  
 1850 1855 1860

Pro Arg Glu Asn Pro Phe Gln Asn Leu Lys Val Leu Leu Val Ser  
 1865 1870 1875

Asp Gln Gln Gln Asn Phe Leu Glu Leu Trp Ser Glu Ile Leu Met  
 1880 1885 1890

Thr Gly Gly Ala Ala Ser Val Lys Gln His His Ser Ser Ala His  
 1895 1900 1905

Asn Lys Asp Ile Ala Leu Gly Val Phe Asp Val Val Val Thr Asp  
 1910 1915 1920

Pro Ser Cys Pro Ala Ser Val Leu Lys Cys Ala Glu Ala Leu Gln  
 1925 1930 1935

Leu Pro Val Val Ser Gln Glu Trp Val Ile Gln Cys Leu Ile Val  
 1940 1945 1950

Gly Glu Arg Ile Gly Phe Lys Gln His Pro Lys Tyr Lys His Asp  
 1955 1960 1965

Tyr Val Ser His  
 1970

<210> 39  
 <211> 1309  
 <212> PRT  
 <213> *Saccharomyces cerevisiae*

<400> 39

Met Ser Gly Gln Leu Val Gln Trp Lys Ser Ser Pro Asp Arg Val Thr  
 1 5 10 15

Gln Ser Ala Ile Lys Glu Ala Leu His Ser Pro Leu Ala Asp Gly Asp  
 20 25 30

Met Asn Glu Met Asn Val Pro Val Asp Pro Leu Glu Asn Lys Val Asn  
 35 40 45

Ser Thr Asn Ile Ile Glu Gly Ser Pro Lys Ala Asn Pro Asn Pro Val  
 50 55 60

Lys Phe Met Asn Thr Ser Glu Ile Phe Gln Lys Ser Leu Gly Leu Leu  
 65 70 75 80

Asp Glu Ser Pro Arg His Asp Asp Glu Leu Asn Ile Glu Val Gly Asp  
 85 90 95

Asn Asp Arg Pro Asn Ala Asn Ile Leu His Asn Glu Arg Thr Pro Asp  
 100 105 110

Leu Asp Arg Ile Ala Asn Phe Phe Lys Ser Asn Arg Thr Pro Gly Lys  
 115 120 125

Glu Asn Leu Leu Thr Lys Tyr Gln Ser Ser Asp Leu Glu Asp Thr Pro  
 130 135 140

Leu Met Leu Arg Lys Lys Met Thr Phe Gln Thr Pro Thr Asp Pro Leu  
 145 150 155 160

Glu Gln Lys Thr Phe Lys Lys Leu Lys Ser Asp Thr Gly Phe Cys Tyr  
 165 170 175

Tyr Gly Glu Gln Asn Asp Gly Glu Glu Asn Ala Ser Leu Glu Val Thr  
 180 185 190

Glu Ala Asp Ala Thr Phe Val Gln Met Ala Glu Arg Ser Ala Asp Asn  
 195 200 205

Tyr Asp Cys Ala Leu Glu Gly Ile Val Thr Pro Lys Arg Tyr Lys Asp  
 210 215 220

Glu Leu Ser Lys Ser Gly Gly Met Gln Asp Glu Arg Val Gln Lys Thr  
 225 230 235 240

Gln Ile Met Ile Ser Ala Glu Ser Pro Asn Ser Ile Ser Ser Tyr Asp  
 245 250 255

Lys Asn Lys Ile Thr Gly Asn Gly Arg Thr Thr Arg Asn Val Asn Lys



|     | 260 |     |     |     |     |     | 265 |     |     |     |     |     | 270 |     |     |  |  |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|--|
| Val | Phe | Asn | Asn | Asn | Glu | Asp | Asn | Ile | Gly | Ala | Ile | Glu | Glu | Lys | Asn |  |  |  |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |  |  |  |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |  |
| Pro | Val | Lys | Lys | Lys | Ser | Glu | Asn | Tyr | Ser | Ser | Asp | Asp | Leu | Arg | Glu |  |  |  |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |  |  |  |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |  |
| Arg | Asn | Asn | Gln | Ile | Ile | Gln | Ser | Asn | Glu | Ser | Glu | Glu | Ile | Asn | Glu |  |  |  |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |  |  |  |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |  |
| Leu | Glu | Lys | Asn | Leu | Asn | Val | Ser | Gly | Arg | Glu | Asn | Asp | Val | Asn | Asn |  |  |  |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |  |  |  |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |  |
| Leu | Asp | Ile | Asp | Ile | Asn | Ser | Ala | Val | Ser | Gly | Thr | Pro | Ser | Arg | Asn |  |  |  |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |  |  |  |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |  |
| Asn | Ala | Glu | Glu | Glu | Met | Tyr | Ser | Ser | Glu | Ser | Val | Asn | Asn | Arg | Glu |  |  |  |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |  |  |  |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |  |
| Pro | Ser | Lys | Lys | Trp | Ile | Phe | Arg | Tyr | Ser | Lys | Asp | Lys | Thr | Glu | Asn |  |  |  |
|     | 370 |     |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |  |  |  |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |  |
| Asn | Ser | Asn | Arg | Ser | Thr | Gln | Ile | Val | Asn | Asn | Pro | Arg | Thr | Gln | Glu |  |  |  |
| 385 |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |  |  |  |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |  |
| Met | Pro | Leu | Asp | Ser | Ile | Ser | Ile | Asp | Thr | Gln | Pro | Leu | Ser | Lys | Ser |  |  |  |
|     |     |     |     | 405 |     |     |     |     | 410 |     |     |     |     | 415 |     |  |  |  |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |  |
| Phe | Asn | Thr | Glu | Thr | Asn | Asn | Glu | Leu | Glu | Thr | Gln | Ile | Ile | Val | Ser |  |  |  |
|     |     |     | 420 |     |     |     |     | 425 |     |     |     |     | 430 |     |     |  |  |  |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |  |
| Ser | Leu | Ser | Gln | Gly | Ile | Ser | Ala | Gln | Lys | Gly | Pro | Val | Phe | His | Ser |  |  |  |
|     |     | 435 |     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |  |  |  |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |  |
| Thr | Gly | Gln | Thr | Glu | Glu | Ile | Lys | Thr | Gln | Ile | Ile | Asn | Ser | Pro | Glu |  |  |  |
|     | 450 |     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     |  |  |  |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |  |
| Gln | Asn | Ala | Leu | Asn | Ala | Thr | Phe | Glu | Thr | Pro | Val | Thr | Leu | Ser | Arg |  |  |  |
| 465 |     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |  |  |  |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |  |
| Ile | Asn | Phe | Glu | Pro | Ile | Leu | Glu | Val | Pro | Glu | Thr | Ser | Ser | Pro | Ser |  |  |  |
|     |     |     |     | 485 |     |     |     |     | 490 |     |     |     |     | 495 |     |  |  |  |

Lys Asn Thr Met Ser Lys Pro Ser Asn Ser Ser Pro Ile Pro Lys Glu  
500 505 510

Lys Asp Thr Phe Asn Ile His Glu Arg Glu Val Glu Thr Asn Asn Val  
515 520 525

Phe Ser Asn Asp Ile Gln Asn Ser Ser Asn Ala Ala Thr Arg Asp Asp  
530 535 540

Ile Ile Ile Ala Gly Ser Ser Asp Phe Asn Glu Gln Lys Glu Ile Thr  
545 550 555 560

Asp Arg Ile Tyr Leu Gln Leu Ser Gly Lys Gln Ile Ser Asp Ser Gly  
565 570 575

Ser Asp Glu Thr Glu Arg Met Ser Pro Asn Glu Leu Asp Thr Lys Lys  
580 585 590

Glu Ser Thr Ile Met Ser Glu Val Glu Leu Thr Gln Glu Leu Pro Glu  
595 600 605

Val Glu Glu Gln Gln Asp Leu Gln Thr Ser Pro Lys Lys Leu Val Val  
610 615 620

Glu Glu Glu Thr Leu Met Glu Ile Lys Lys Ser Lys Gly Asn Ser Leu  
625 630 635 640

Gln Leu His Asp Asp Asn Lys Glu Cys Asn Ser Asp Lys Gln Asp Gly  
645 650 655

Thr Glu Ser Leu Asp Val Ala Leu Ile Glu His Glu Ser Lys Gly Gln  
660 665 670

Ser Ser Glu Leu Gln Lys Asn Leu Met Gln Leu Phe Pro Ser Glu Ser  
675 680 685

Gln Glu Ile Ile Gln Asn Arg Arg Thr Ile Lys Arg Arg Gln Lys Asp  
690 695 700

Thr Ile Glu Ile Gly Glu Glu Glu Glu Asn Arg Ser Thr Lys Thr Ser  
705 710 715 720

Pro Thr Lys His Leu Lys Arg Asn Ser Asp Leu Asp Ala Ala Ser Ile  
725 730 735

Lys Arg Glu Pro Ser Cys Ser Ile Thr Ile Gln Thr Gly Glu Thr Gly  
740 745 750

Ser Gly Lys Asp Ser Lys Glu Gln Ser Tyr Val Phe Pro Glu Gly Ile  
755 760 765

Arg Thr Ala Asp Asn Ser Phe Leu Ser Lys Asp Asp Ile Ile Phe Gly  
770 775 780

Asn Ala Val Trp Cys Gln Tyr Thr Trp Asn Tyr Lys Phe Tyr Pro Gly  
785 790 795 800

Ile Leu Leu Glu Val Asp Thr Asn Gln Asp Gly Cys Trp Ile Tyr Phe  
805 810 815

Glu Thr Gly Arg Ser Leu Thr Lys Asp Glu Asp Ile Tyr Tyr Leu Asp  
820 825 830

Ile Arg Ile Gly Asp Ala Val Thr Phe Asp Gly Asn Glu Tyr Val Val  
835 840 845

Val Gly Leu Glu Cys Arg Ser His Asp Leu Asn Ile Ile Arg Cys Ile  
850 855 860

Arg Gly Tyr Asp Thr Val His Leu Lys Lys Lys Asn Ala Ser Gly Leu  
865 870 875 880

Leu Gly Lys Arg Thr Leu Ile Lys Ala Leu Ser Ser Ile Ser Leu Asp  
885 890 895

Leu Ser Glu Trp Ala Lys Arg Ala Lys Ile Ile Leu Glu Asp Asn Glu  
900 905 910

Lys Asn Lys Gly Asp Ala Tyr Arg Tyr Leu Arg His Pro Ile Arg Gly  
915 920 925

Arg Lys Ser Met Thr Asn Val Leu Ser Pro Lys Lys His Thr Asp Asp  
930 935 940

Glu Lys Asp Ile Asn Thr His Thr Glu Val Tyr Asn Asn Glu Ile Glu  
 945 950 955 960

Ser Ser Ser Glu Lys Lys Glu Ile Val Lys Lys Asp Ser Arg Asp Ala  
 965 970 975

Leu Ala Glu His Ala Gly Ala Pro Ser Leu Leu Phe Ser Ser Gly Glu  
 980 985 990

Ile Arg Thr Gly Asn Val Phe Asp Lys Cys Ile Phe Val Leu Thr Ser  
 995 1000 1005

Leu Phe Glu Asn Arg Glu Glu Leu Arg Gln Thr Ile Glu Ser Gln  
 1010 1015 1020

Gly Gly Thr Val Ile Glu Ser Gly Phe Ser Thr Leu Phe Asn Phe  
 1025 1030 1035

Thr His Pro Leu Ala Lys Ser Leu Val Asn Lys Gly Asn Thr Asp  
 1040 1045 1050

Asn Ile Arg Glu Leu Ala Leu Lys Leu Ala Trp Lys Pro His Ser  
 1055 1060 1065

Leu Phe Ala Asp Cys Arg Phe Ala Cys Leu Ile Thr Lys Arg His  
 1070 1075 1080

Leu Arg Ser Leu Lys Tyr Leu Glu Thr Leu Ala Leu Gly Trp Pro  
 1085 1090 1095

Thr Leu His Trp Lys Phe Ile Ser Ala Cys Ile Glu Lys Lys Arg  
 1100 1105 1110

Ile Val Pro His Leu Ile Tyr Gln Tyr Leu Leu Pro Ser Gly Glu  
 1115 1120 1125

Ser Phe Arg Leu Ser Leu Asp Ser Pro Ser Lys Gly Gly Ile Ile  
 1130 1135 1140

Lys Ser Asn Asn Ile Phe Ser Phe Tyr Thr Gln Phe Leu Arg Gly  
 1145 1150 1155

Ser Asn Leu Arg Asp Gln Ile Cys Gly Val Lys Lys Met Leu Asn

|   |  |      |  |      |
|---|--|------|--|------|
| 1160  |  | 1165 |  | 1170 |
| Asp Tyr Ile Val Ile Val Trp Gly Arg Ser Glu Leu Asp Ser Phe |  |      |  |      |
| 1175  |  | 1180 |  | 1185 |
| Val Lys Phe Ala Phe Ala Cys Leu Ser Ala Gly Arg Met Leu Thr |  |      |  |      |
| 1190  |  | 1195 |  | 1200 |
| Ile Asp Leu Pro Asn Ile Asp Val Asp Asp Thr Glu Pro Leu Leu |  |      |  |      |
| 1205  |  | 1210 |  | 1215 |
| Asn Ala Leu Asp Ser Leu Val Pro Arg Ile Gly Ser Glu Leu Ser |  |      |  |      |
| 1220  |  | 1225 |  | 1230 |
| Asn Arg Lys Leu Lys Phe Leu Ile Tyr Ala Asn Glu Asn Asn Gly |  |      |  |      |
| 1235  |  | 1240 |  | 1245 |
| Lys Ser Gln Met Lys Leu Leu Glu Arg Leu Arg Ser Gln Ile Ser |  |      |  |      |
| 1250  |  | 1255 |  | 1260 |
| Leu Lys Phe Lys Lys Phe Asn Tyr Ile Phe His Thr Glu Ser Lys |  |      |  |      |
| 1265  |  | 1270 |  | 1275 |
| Glu Trp Leu Ile Gln Thr Ile Ile Asn Glu Asp Thr Gly Phe His |  |      |  |      |
| 1280  |  | 1285 |  | 1290 |
| Asp Asp Ile Thr Asp Asn Asp Ile Tyr Asn Thr Ile Ser Glu Val |  |      |  |      |
| 1295  |  | 1300 |  | 1305 |

Arg

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<223> Xaa can be any naturally occurring amino acid

<220>  
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<222> (5)..(6)  
<223> Xaa can be any naturally occurring amino acid

<400> 43

Arg Xaa Arg Ser Xaa Xaa  
1 5

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<400> 44

Arg Ser Xaa Xaa Xaa Pro  
1 5

<210> 45  
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<220>  
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<223> Xaa can be any naturally occurring amino acid

<220>  
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<223> Xaa can be any naturally occurring amino acid

<400> 45

Xaa Pro Xaa Arg  
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<210> 46  
<211> 16  
<212> PRT  
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<220>  
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<220>  
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<223> Xaa can be any naturally occurring amino acid

<400> 46

Met Ala Xaa Xaa Xaa Xaa Thr Pro Xaa Xaa Xaa Xaa Ala Lys Lys Lys  
1 5 10 15

<210> 47  
<211> 15  
<212> PRT  
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<220>  
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<222> (8)..(11)  
<223> Xaa can be any naturally occurring amino acid

<400> 47

Met Ala Xaa Xaa Xaa Xaa Thr Xaa Xaa Xaa Xaa Ala Lys Lys Lys  
1 5 10 15

<210> 48

<211> 16

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<222> (9)..(12)

<223> Xaa can be any naturally occurring amino acid

<400> 48

Met Ala Xaa Xaa Xaa Xaa Ser Thr Xaa Xaa Xaa Xaa Ala Lys Lys Lys  
1 5 10 15

<210> 49

<211> 14

<212> PRT

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<221> misc\_feature

<222> (8)..(10)

<223> Xaa can be any naturally occurring amino acid

<400> 49

Met Ala Xaa Xaa Xaa Ser Pro Xaa Xaa Xaa Ala Lys Lys Lys  
1 5 10



<210> 50  
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<220>  
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<220>  
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<220>  
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<222> (8)..(11)  
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<400> 50

Met Ala Xaa Xaa Xaa Xaa Ser Xaa Xaa Xaa Xaa Ala Lys Lys Lys  
1 5 10 15

<210> 51  
<211> 6  
<212> PRT  
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<220>  
<223> synthetic

<400> 51

Met Gln Ser Thr Pro Leu  
1 5

<210> 52  
<211> 3  
<212> PRT  
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<220>  
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<223> Xaa can be any naturally occurring amino acid

<400> 52

Ser Xaa Xaa  
1

<210> 53  
<211> 7  
<212> PRT  
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<220>  
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<400> 53

Leu Leu Cys Ser Thr Pro Asn  
1 5

<210> 54  
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<220>  
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<220>  
<221> misc\_feature  
<222> (9)..(12)  
<223> Xaa can be any naturally occurring amino acid

<400> 54

Met Ala Xaa Xaa Xaa Xaa Ser Ser Xaa Xaa Xaa Xaa Ala Lys Lys Lys  
1 5 10 15

<210> 55  
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<212> PRT  
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<220>  
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<222> (5)..(6)  
<223> Xaa can be any naturally occurring amino acid

<400> 55

Arg Xaa Arg Ser Xaa Xaa  
1 5

<210> 56  
<211> 16  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> synthetic

<400> 56

Met Ala Gly Pro Met Gln Ser Thr Pro Leu Asn Gly Ala Tyr Lys Lys  
1 5 10 15

<210> 57  
<211> 16  
<212> PRT  
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<220>  
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<222> (9)..(12)  
<223> Xaa can be any naturally occurring amino acid

<400> 57

Met Ala Xaa Xaa Xaa Xaa Xaa Gln Xaa Xaa Xaa Xaa Ala Lys Lys Lys  
1 5 10 15

<210> 58  
<211> 16  
<212> PRT  
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 <223> Xaa can be any naturally occurring amino acid

<220>  
 <221> misc\_feature  
 <222> (8)..(12)  
 <223> Xaa can be any naturally occurring amino acid

<400> 58

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Xaa | Xaa | Xaa | Xaa | Ser | Xaa | Xaa | Xaa | Xaa | Xaa | Ala | Lys | Lys | Lys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |

<210> 59  
 <211> 17  
 <212> PRT  
 <213> Artificial Sequence

<220>  
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<220>  
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 <223> Xaa can be any naturally occurring amino acid

<220>  
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 <222> (8)..(9)  
 <223> Xaa can be any naturally occurring amino acid

<220>  
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 <222> (11)..(12)  
 <223> Xaa can be any naturally occurring amino acid

<400> 59

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Ala | Xaa | Xaa | Xaa | Xaa | Ser | Xaa | Xaa | Phe | Xaa | Xaa | Ala | Tyr | Lys | Lys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |

Lys

<210> 60  
 <211> 9  
 <212> PRT  
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<220>  
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<220>  
 <221> misc\_feature  
 <222> (4)..(4)  
 <223> Xaa can be any naturally occurring amino acid  
  
 <400> 60

Tyr Asp Ile Xaa Gln Val Phe Pro Phe  
 1 5

<210> 61  
 <211> 20  
 <212> PRT  
 <213> Artificial Sequence

<220>  
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<220>  
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 <222> (1)..(1)  
 <223> Xaa can be any naturally occurring amino acid

<220>  
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 <222> (3)..(3)  
 <223> Xaa can be any naturally occurring amino acid

<220>  
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 <222> (7)..(11)  
 <223> Xaa can be any naturally occurring amino acid

<220>  
 <221> misc\_feature  
 <222> (13)..(16)  
 <223> Xaa can be any naturally occurring amino acid

<400> 61

Xaa Gly Xaa Gly Gly Ala Xaa Xaa Xaa Xaa Xaa Gln Xaa Xaa Xaa Xaa  
 1 5 10 15

Ala Lys Lys Lys  
 20

<210> 62  
 <211> 16  
 <212> PRT  
 <213> Artificial Sequence

<220>  
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<220>  
<221> misc\_feature  
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<223> Xaa can be any naturally occurring amino acid

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<222> (9)..(12)  
<223> Xaa can be any naturally occurring amino acid

<400> 62

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Ala | Xaa | Xaa | Xaa | Xaa | Xaa | Gln | Xaa | Xaa | Xaa | Xaa | Ala | Lys | Lys | Lys |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     | 15  |     |     |

<210> 63

<400> 63  
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<210> 64

<400> 64  
000

<210> 65  
<211> 16  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> synthetic

<400> 65

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Gly | Pro | Met | Gln | Ser | Ser | Pro | Leu | Asn | Gly | Ala | Tyr | Lys | Lys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |

<210> 66  
<211> 16  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> synthetic

<400> 66

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Gly | Pro | Met | Gln | Ser | Tyr | Pro | Leu | Asn | Gly | Ala | Tyr | Lys | Lys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |

<210> 67  
<211> 15  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> synthetic

<400> 67

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Gly | Pro | Met | Gln | Val | Thr | Pro | Leu | Asn | Gly | Ala | Lys | Lys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     | 15  |     |

<210> 68  
<211> 16  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> synthetic

<400> 68

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Gly | Pro | Met | Gln | Ala | Thr | Pro | Leu | Asn | Gly | Ala | Tyr | Lys | Lys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |

<210> 69  
<211> 16  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> synthetic

<400> 69

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Gly | Pro | Met | Gln | Gly | Thr | Pro | Leu | Asn | Gly | Ala | Tyr | Lys | Lys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |

<210> 70  
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<212> PRT  
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<220>  
<223> synthetic

<400> 70

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Gly | Pro | Met | Gln | Cys | Thr | Pro | Leu | Asn | Gly | Ala | Tyr | Lys | Lys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |

<210> 71  
<211> 16  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> synthetic

<400> 71

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Gly | Pro | Met | Gln | Thr | Thr | Pro | Leu | Asn | Gly | Ala | Tyr | Lys | Lys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |

<210> 72  
<211> 15  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> synthetic

<400> 72

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Gly | Pro | Met | Gln | Ser | Thr | Asn | Leu | Asn | Gly | Ala | Lys | Lys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |

<210> 73  
<211> 13  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> synthetic

<400> 73

|     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Gln | Leu | Leu | Cys | Ser | Thr | Pro | Asn | Gly | Leu | Asp | Arg |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |

<210> 74  
<211> 13  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> synthetic

<400> 74

|     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Pro | Arg | Leu | Leu | Cys | Ser | Thr | Pro | Ser | Phe | Lys | Lys | Thr |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |

<210> 75



<211> 603  
 <212> PRT  
 <213> Rattus norvegicus

<400> 75

Met Asn Ala Ala Ala Lys Ala Gly Lys Leu Ala Arg Ala Pro Ala Asp  
 1 5 10 15

Leu Gly Lys Gly Gly Val Pro Gly Asp Ala Val Pro Gly Ala Pro Val  
 20 25 30

Ala Ala Pro Leu Ala Lys Glu Ile Pro Glu Val Leu Val Asp Pro Arg  
 35 40 45

Ser Arg Gln Gln Tyr Val Arg Gly Arg Phe Leu Gly Lys Gly Gly Phe  
 50 55 60

Ala Lys Cys Phe Glu Ile Ser Asp Ser Asp Thr Lys Glu Val Phe Pro  
 65 70 75 80

Gly Lys Ile Val Pro Lys Ser Leu Leu Lys Pro His Gln Lys Glu  
 85 90 95

Lys Met Ser Met Glu Thr Ser Ile His Arg Ser Leu Glu His Gln His  
 100 105 110

Val Val Gly Phe His Gly Phe Phe Glu Asp Ser Asp Phe Val Phe Val  
 115 120 125

Val Leu Glu Leu Cys Arg Arg Arg Ser Leu Leu Glu Leu His Lys Arg  
 130 135 140

Arg Lys Ala Leu Thr Glu Pro Glu Ala Arg Tyr Tyr Leu Arg Gln Ile  
 145 150 155 160

Val Leu Gly Cys Gln Tyr Leu His Arg Asn Gln Val Ile His Arg Asp  
 165 170 175

Leu Lys Leu Gly Asn Leu Phe Leu Asn Glu Asp Leu Glu Val Lys Ile  
 180 185 190

Gly Asp Phe Gly Leu Ala Thr Lys Val Glu Tyr Glu Gly Glu Arg Lys  
 195 200 205

Lys Thr Leu Cys Gly Thr Pro Asn Tyr Ile Ala Pro Glu Val Leu Ser  
 210 215 220

Lys Lys Gly His Ser Phe Glu Val Asp Val Trp Ser Ile Gly Cys Ile  
 225 230 235 240

Met Tyr Thr Leu Leu Val Gly Lys Pro Pro Phe Glu Thr Ser Cys Leu  
 245 250 255

Lys Glu Thr Tyr Leu Arg Ile Lys Lys Asn Glu Tyr Ser Ile Pro Lys  
 260 265 270

His Ile Asn Pro Val Ala Ala Ser Leu Ile Gln Lys Met Leu Gln Thr  
 275 280 285

Asp Pro Ala Ala Arg Pro Thr Ile His Glu Leu Leu Asn Asp Glu Phe  
 290 295 300

Phe Thr Ser Gly Tyr Ile Pro Ala Arg Leu Pro Ile Thr Cys Leu Thr  
 305 310 315 320

Ile Pro Pro Arg Phe Ser Ile Ala Pro Ser Ser Leu Asp Pro Ser Asn  
 325 330 335

Arg Lys Pro Leu Thr Val Leu Asn Lys Gly Val Glu Asn Pro Leu Pro  
 340 345 350

Asp Arg Pro Arg Glu Lys Glu Glu Pro Val Val Arg Glu Thr Asn Glu  
 355 360 365

Ala Ile Glu Cys His Leu Ser Asp Leu Leu Gln Gln Leu Thr Ser Val  
 370 375 380

Asn Ala Ser Lys Pro Ser Glu Arg Gly Leu Val Arg Gln Glu Glu Ala  
 385 390 395 400

Glu Asp Pro Ala Cys Ile Pro Ile Phe Trp Val Ser Lys Trp Val Asp  
 405 410 415

Tyr Ser Asp Lys Tyr Gly Leu Gly Tyr Gln Leu Cys Asp Asn Ser Val  
 420 425 430

Gly Val Leu Phe Asn Asp Ser Thr Arg Leu Ile Leu Tyr Asn Asp Gly  
 435 440 445

Asp Ser Leu Gln Tyr Ile Glu Arg Asp Gly Thr Glu Ser Tyr Leu Thr  
 450 455 460

Val Ser Ser His Pro Asn Ser Leu Met Lys Lys Ile Thr Leu Leu Asn  
 465 470 475 480

Tyr Phe Arg Asn Tyr Met Ser Glu His Leu Leu Lys Ala Gly Ala Asn  
 485 490 495

Ile Thr Pro Arg Glu Gly Asp Glu Leu Ala Arg Leu Pro Tyr Leu Arg  
 500 505 510

Thr Trp Phe Arg Thr Arg Ser Ala Ile Ile Leu His Leu Ser Asn Gly  
 515 520 525

Thr Val Gln Ile Asn Phe Phe Gln Asp His Thr Lys Leu Ile Arg Gly  
 530 535 540

Pro Leu Met Ala Ala Val Thr Tyr Ile Asn Glu Lys Arg Asp Phe Arg  
 545 550 555 560

Thr Tyr Arg Leu Ser Leu Leu Glu Glu Tyr Gly Cys Cys Lys Glu Leu  
 565 570 575

Ala Ser Arg Leu Arg Tyr Ala Arg Thr Met Val Asp Lys Leu Leu Ser  
 580 585 590

Ser Arg Ser Ala Cys Asn Arg Leu Lys Ala Ser  
 595 600

<210> 76  
 <211> 648  
 <212> PRT  
 <213> Caenorhabditis elegans

<400> 76

Met Asn Arg Leu Pro Asn Ile Ala Lys Pro Pro Gln Lys Ser Asn Gln  
 1 5 10 15

Arg Lys Glu Lys Ala Pro Pro Glu Val Pro Ala Leu Ile Ala Asp Lys  
 20 25 30

Asp Arg Gly Thr Tyr Tyr Glu Lys Gly Arg Phe Leu Gly Lys Gly Gly  
 35 40 45  
 Phe Ala His Cys Tyr Glu Leu Thr Asn Arg Ala Thr Arg Glu Val Val  
 50 55 60  
 Ala Gly Lys Val Val Pro Lys Ser Met Leu Val Lys Gln Tyr Gln Arg  
 65 70 75 80  
 Asp Lys Met Thr Gln Glu Val Gln Ile His Arg Glu Leu Gly His Ile  
 85 90 95  
 Asn Ile Val Lys Leu Phe Asn Phe Phe Glu Asp Asn Leu Asn Val Tyr  
 100 105 110  
 Ile Thr Leu Glu Leu Cys Ala Arg Arg Ser Leu Met Glu Leu His Lys  
 115 120 125  
 Arg Arg Lys Ala Val Thr Glu Pro Glu Ala Arg Tyr Phe Thr His Gln  
 130 135 140  
 Ile Val Asp Gly Val Leu Tyr Leu His Asp Leu Asn Ile Ile His Arg  
 145 150 155 160  
 Asp Met Lys Leu Gly Asn Leu Phe Leu Asn Asp Asp Leu Val Val Lys  
 165 170 175  
 Ile Gly Asp Phe Gly Leu Ala Thr Thr Val Asn Gly Asp Glu Arg Lys  
 180 185 190  
 Lys Thr Leu Cys Gly Thr Pro Asn Tyr Ile Ala Pro Glu Val Leu Asn  
 195 200 205  
 Lys Ala Gly His Ser Phe Glu Val Asp Ile Trp Ala Val Gly Cys Ile  
 210 215 220  
 Leu Tyr Ile Leu Leu Phe Gly Gln Pro Pro Phe Glu Ser Lys Ser Leu  
 225 230 235 240  
 Glu Glu Thr Tyr Ser Arg Ile Arg His Asn Asn Tyr Thr Ile Pro Ser  
 245 250 255

Ile Ala Thr Gln Pro Ala Ala Ser Leu Ile Arg Lys Met Leu Asp Pro  
 260 265 270

Glu Pro Thr Arg Arg Pro Thr Ala Lys Gln Val Gln Arg Asp Gly Phe  
 275 280 285

Phe Lys Ser Gly Phe Met Pro Thr Arg Leu Pro Val Ser Cys Leu Thr  
 290 295 300

Met Val Pro Lys Phe Gly Gly His Glu Thr Ser Met Met Glu Glu Asn  
 305 310 315 320

Val Ala Pro Arg Gly Val Asp Ala Arg Ser Gln Arg Pro Leu Asn Gly  
 325 330 335

Arg Ala Gly Leu Ser Ala Leu Pro Gln His Ile Val Ser Asn Asn Ala  
 340 345 350

Asp Arg Glu Arg Ala Gln Gln Gln Ala Ala Glu Ala Thr Phe Arg Glu  
 355 360 365

Pro Glu Asp Ala Tyr Leu Ser Gln Leu Phe His Gln Val Ala Val Leu  
 370 375 380

Leu Glu Gln Arg Ile Pro Gly Leu Glu Glu Glu Glu Ala Ala Leu Asp  
 385 390 395 400

Gly Tyr Gln Ser Pro Glu Cys Leu Pro Val Phe Trp Ile Ser Lys Trp  
 405 410 415

Val Asp Tyr Ser Asp Lys Tyr Gly Ile Gly Tyr Gln Leu Cys Asp Asn  
 420 425 430

Ser Val Gly Val Leu Phe Asn Asp Asn Ser Arg Ile Met Leu Asp Gln  
 435 440 445

Ala Gly Asn Glu Leu Thr Tyr Ile Glu Lys Ser Asn Lys Glu His Tyr  
 450 455 460

Phe Ser Met His Ser Gly Glu Met Pro Gly Leu Leu Asn Lys Lys Val  
 465 470 475 480

Thr Leu Leu Lys Tyr Phe Arg Ser Tyr Met Asn Asp His Leu Val Lys  
485 490 495

Ala Gly Glu Gly Ser Glu Gln Arg Ala Gly Asp Asp Leu Ala Arg Leu  
500 505 510

Pro Thr Leu Arg Val Trp Phe Arg Thr Lys Ser Ala Ile Val Leu His  
515 520 525

Leu Ser Asn Gly Thr Val Gln Ile Asn Phe Phe Asn Asp His Val Lys  
530 535 540

Met Met Met Cys Pro Leu Met Gln Ala Val Thr Phe Ile Asp Gln Asn  
545 550 555 560

Lys Arg Met Leu Thr Tyr Lys Leu Asn Asn Leu Gln Arg Asn Gly Cys  
565 570 575

Pro Glu Lys Phe Leu His Arg Leu Lys Tyr Ala Lys Thr Met Ile Glu  
580 585 590

Arg Leu Met Ser Asp Ala Asn Val Val Ser Gln Asn Pro Ala Arg Gln  
595 600 605

Pro Asp Met Pro Arg Ser Met Ala Ala Ala Arg Ser Ala Ser Ala Gly  
610 615 620

Ser Arg Gly Pro Asn Gln Ala Ala Ser His Leu Pro Gln Ser Ala Ser  
625 630 635 640

Gly Ser Asn Ile His Pro Arg Arg  
645

<210> 77  
<211> 278  
<212> PRT  
<213> Homo sapiens

<400> 77

Ser Ile Ala Pro Ser Ser Leu Asp Pro Ser Asn Arg Lys Pro Leu Thr  
1 5 10 15

Val Leu Asn Lys Gly Leu Glu Asn Pro Leu Pro Glu Arg Pro Arg Glu  
20 25 30

Lys Glu Glu Pro Val Val Arg Glu Thr Gly Glu Val Val Asp Cys His  
 35 40 45

Leu Ser Asp Met Leu Gln Gln Leu His Ser Val Asn Ala Ser Lys Pro  
 50 55 60

Ser Glu Arg Gly Leu Val Arg Gln Glu Glu Ala Glu Asp Pro Ala Cys  
 65 70 75 80

Ile Pro Ile Phe Trp Val Ser Lys Trp Val Asp Tyr Ser Asp Lys Tyr  
 85 90 95

Gly Leu Gly Tyr Gln Leu Cys Asp Asn Ser Val Gly Val Leu Phe Asn  
 100 105 110

Asp Ser Thr Arg Leu Ile Leu Tyr Asn Asp Gly Asp Ser Leu Gln Tyr  
 115 120 125

Ile Glu Arg Asp Gly Thr Glu Ser Tyr Leu Thr Val Ser Ser His Pro  
 130 135 140

Asn Ser Leu Met Lys Lys Ile Thr Leu Leu Lys Tyr Phe Arg Asn Tyr  
 145 150 155 160

Met Ser Glu His Leu Leu Lys Ala Gly Ala Asn Ile Thr Pro Arg Glu  
 165 170 175

Gly Asp Glu Leu Ala Arg Leu Pro Tyr Leu Arg Thr Trp Phe Arg Thr  
 180 185 190

Arg Ser Ala Ile Ile Leu His Leu Ser Asn Gly Ser Val Gln Ile Asn  
 195 200 205

Phe Phe Gln Asp His Thr Lys Leu Ile Leu Cys Pro Leu Met Ala Ala  
 210 215 220

Val Thr Tyr Ile Asp Glu Lys Arg Asp Phe Arg Thr Tyr Arg Leu Ser  
 225 230 235 240

Leu Leu Glu Glu Tyr Gly Cys Cys Lys Glu Leu Ala Ser Arg Leu Arg  
 245 250 255

Tyr Ala Arg Thr Met Val Asp Lys Leu Leu Ser Ser Arg Ser Ala Ser  
260 265 270

Asn Arg Leu Lys Ala Ser  
275

<210> 78  
<211> 282  
<212> PRT  
<213> *Xenopus laevis*

<400> 78

Ser Ile Ala Pro Ser Thr Ile Asp Gln Ser Leu Arg Lys Pro Leu Thr  
1 5 10 15

Ala Ile Asn Lys Gly Gln Asp Ser Pro Leu Val Glu Lys Gln Val Ala  
20 25 30

Pro Ala Lys Glu Glu Glu Met Gln Gln Pro Glu Phe Thr Glu Pro Ala  
35 40 45

Asp Cys Tyr Leu Ser Glu Met Leu Gln Gln Leu Thr Cys Leu Asn Ala  
50 55 60

Val Lys Pro Ser Glu Arg Ala Leu Ile Arg Gln Glu Glu Ala Glu Asp  
65 70 75 80

Pro Ala Ser Ile Pro Ile Phe Trp Ile Ser Lys Trp Val Asp Tyr Ser  
85 90 95

Asp Lys Tyr Gly Leu Gly Tyr Gln Leu Cys Asp Asn Ser Val Gly Val  
100 105 110

Leu Phe Asn Asp Ser Thr Arg Leu Ile Met Tyr Asn Asp Gly Asp Ser  
115 120 125

Leu Gln Tyr Ile Glu Arg Asn Asn Thr Glu Ser Tyr Leu Asn Val Arg  
130 135 140

Ser Tyr Pro Thr Thr Leu Thr Lys Lys Ile Thr Leu Leu Lys Tyr Phe  
145 150 155 160

Arg Asn Tyr Met Ser Glu His Leu Leu Lys Ala Gly Ala Asn Thr Thr



|   |     |         |
|---|-----|---------|
| 165   | 170 | 175     |
| Pro Arg Glu Gly Asp Glu Leu Ala Arg Leu Pro Phe Leu Arg Thr Trp |     |         |
| 180   | 185 | 190     |
| Phe Arg Thr Arg Ser Ala Ile Ile Leu His Leu Ser Asn Gly Thr Val |     |         |
| 195   | 200 | 205     |
| Gln Ile Asn Phe Phe Gln Asp His Thr Lys Ile Ile Leu Cys Pro Leu |     |         |
| 210   | 215 | 220     |
| Met Ala Ala Val Ser Tyr Ile Asp Glu Lys Arg Glu Phe Arg Thr Tyr |     |         |
| 225   | 230 | 235 240 |
| Lys Leu Ser Leu Ile Gln Glu Phe Gly Cys Cys Lys Glu Leu Ala Ser |     |         |
| 245   | 250 | 255     |
| Arg Leu Arg Tyr Ala Arg Thr Met Val Glu Lys Leu Gln Ser Ser Lys |     |         |
| 260   | 265 | 270     |
| Ser Ala Val Ala His Val Lys Ala Ser Ala                         |     |         |
| 275   | 280 |         |
| <210> 79  |     |         |
| <211> 279   |     |         |
| <212> PRT   |     |         |
| <213> Drosophila melanogaster                                   |     |         |
| <400> 79  |     |         |
| Gly Ser Asn Asp Thr Ile Glu Asp Ser Met His Arg Lys Pro Leu Met |     |         |
| 1   | 5   | 10 15   |
| Glu Met Asn Gly Ile Arg Pro Asp Asp Thr Arg Leu Glu Ser Thr Phe |     |         |
| 20  | 25  | 30      |
| Leu Lys Ala Asn Leu His Asp Ala Ile Thr Ala Ser Ala Gln Val Cys |     |         |
| 35  | 40  | 45      |
| Arg His Ser Glu Asp Tyr Arg Ser Asp Ile Glu Ser Leu Tyr Gln Gln |     |         |
| 50  | 55  | 60      |
| Leu Thr Asn Leu Ile Asn Gly Lys Pro Arg Ile Leu Gln Gly Asn Leu |     |         |
| 65  | 70  | 75 80   |

Gly Asp Glu Asn Thr Asp Pro Ala Ala Gln Pro Leu Phe Trp Ile Ser  
85 90 95

Lys Trp Val Asp Tyr Ser Asp Lys Tyr Gly Phe Gly Tyr Gln Leu Cys  
100 105 110

Asp Glu Gly Ile Gly Val Met Phe Asn Asp Thr Thr Lys Leu Ile Leu  
115 120 125

Leu Pro Asn Gln Ile Asn Val His Phe Ile Asp Lys Asp Gly Lys Glu  
130 135 140

Thr Tyr Met Thr Thr Thr Asp Tyr Cys Lys Ser Leu Asp Lys Lys Met  
145 150 155 160

Lys Leu Leu Ser Tyr Phe Lys Arg Tyr Met Ile Glu His Leu Val Lys  
165 170 175

Ala Gly Ala Asn Asn Val Asn Ile Glu Ser Asp Gln Ile Ser Arg Met  
180 185 190

Pro His Leu His Ser Trp Phe Arg Thr Thr Cys Ala Val Val Met His  
195 200 205

Leu Thr Asn Gly Ser Val Gln Leu Asn Phe Ser Asp His Met Lys Leu  
210 215 220

Ile Leu Cys Pro Arg Met Ser Ala Ile Thr Tyr Met Asp Gln Glu Lys  
225 230 235 240

Asn Phe Arg Thr Tyr Arg Phe Ser Thr Ile Val Glu Asn Gly Val Ser  
245 250 255

Lys Asp Leu Tyr Gln Lys Ile Arg Tyr Ala Gln Glu Lys Leu Arg Lys  
260 265 270

Met Leu Glu Lys Met Phe Thr  
275

<210> 80  
<211> 13  
<212> PRT  
<213> Artificial Sequence

<220>

<223> synthetic

<400> 80

Ala Gln Leu Leu Cys Ser Thr Pro Asn Gly Leu Asp Arg

1 5 10

<210> 81

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic

<400> 81

Pro Arg Leu Leu Cys Ser Thr Pro Ser Phe Lys Lys Thr

1 5 10

<210> 82

<211> 197

<212> PRT

<213> Homo sapiens

<400> 82

Pro Ile Phe Trp Val Ser Lys Trp Val Asp Tyr Ser Asp Lys Tyr Gly

1 5 10 15

Leu Gly Tyr Gln Leu Cys Asp Asn Ser Val Gly Val Leu Phe Asn Asp

20 25 30

Ser Thr Arg Leu Ile Leu Tyr Asn Asp Gly Asp Ser Leu Gln Tyr Ile

35 40 45

Glu Arg Asp Gly Thr Glu Ser Tyr Leu Thr Val Ser Ser His Pro Asn

50 55 60

Ser Leu Met Lys Lys Ile Thr Leu Leu Lys Tyr Phe Arg Asn Tyr Met

65 70 75 80

Ser Glu His Leu Leu Lys Ala Gly Ala Asn Ile Thr Pro Arg Glu Gly

85 90 95

Asp Glu Leu Ala Arg Leu Pro Tyr Leu Arg Thr Trp Phe Arg Thr Arg

100 105 110

Ser Ala Ile Ile Leu His Leu Ser Asn Gly Ser Val Gln Ile Asn Phe  
115 120 125

Phe Gln Asp His Ile Lys Leu Ile Leu Cys Pro Leu Met Ala Ala Val  
130 135 140

Thr Tyr Ile Asp Glu Lys Arg Asp Phe Arg Thr Tyr Arg Leu Ser Leu  
145 150 155 160

Leu Glu Glu Tyr Gly Cys Cys Lys Glu Leu Ala Ser Arg Leu Arg Tyr  
165 170 175

Ala Arg Thr Met Val Asp Lys Leu Leu Ser Ser Arg Ser Ala Ser Asn  
180 185 190

Arg Leu Lys Ala Ser  
195

<210> 83  
<211> 197  
<212> PRT  
<213> Mus musculus

<400> 83

Pro Ile Phe Trp Val Ser Lys Trp Val Asp Tyr Ser Asp Lys Tyr Gly  
1 5 10 15

Leu Gly Tyr Gln Leu Cys Asp Asn Ser Val Gly Val Leu Phe Asn Asp  
20 25 30

Ser Thr Arg Leu Ile Leu Tyr Asn Asp Gly Asp Ser Leu Gln Tyr Ile  
35 40 45

Glu Arg Asp Gly Thr Glu Ser Tyr Leu Thr Val Ser Ser His Pro Asn  
50 55 60

Ser Leu Met Lys Lys Ile Thr Leu Leu Asn Tyr Phe Arg Asn Tyr Met  
65 70 75 80

Ser Glu His Leu Leu Lys Ala Gly Ala Asn Ile Thr Pro Arg Glu Gly  
85 90 95

Asp Glu Leu Ala Arg Leu Pro Tyr Leu Arg Thr Trp Phe Arg Thr Arg  
100 105 110

Ser Ala Ile Ile Leu His Leu Ser Asn Gly Thr Val Gln Ile Asn Phe  
115 120 125

Phe Gln Asp His Thr Lys Leu Ile Leu Cys Pro Leu Met Ala Ala Val  
130 135 140

Thr Tyr Ile Asn Glu Lys Arg Asp Phe Gln Thr Tyr Arg Leu Ser Leu  
145 150 155 160

Leu Glu Glu Tyr Gly Cys Cys Lys Glu Leu Ala Ser Arg Leu Arg Tyr  
165 170 175

Ala Arg Thr Met Val Asp Lys Leu Leu Ser Ser Arg Ser Ala Ser Asn  
180 185 190

Arg Leu Lys Ala Ser  
195

<210> 84  
<211> 197  
<212> PRT  
<213> Rattus norvegicus

<400> 84

Pro Ile Phe Trp Val Ser Lys Trp Val Asp Tyr Ser Asp Lys Tyr Gly  
1 5 10 15

Leu Gly Tyr Asp Leu Cys Asp Asn Ser Val Gly Val Leu Phe Asn Asp  
20 25 30

Ser Thr Arg Leu Ile Leu Tyr Asn Asp Gly Asp Ser Leu Gln Tyr Ile  
35 40 45

Glu Arg Asp Gly Thr Glu Ser Tyr Leu Thr Val Ser Ser His Pro Asn  
50 55 60

Ser Leu Met Lys Lys Ile Thr Leu Leu Asn Tyr Phe Arg Asn Tyr Met  
65 70 75 80

Ser Glu His Leu Leu Lys Ala Gly Ala Asn Ile Thr Pro Arg Glu Gly  
85 90 95

Asp Glu Leu Ala Arg Leu Pro Tyr Leu Arg Thr Trp Phe Arg Thr Arg  
100 105 110

Ser Ala Ile Ile Leu His Leu Ser Asn Gly Thr Val Gln Ile Asn Phe  
115 120 125

Phe Gln Asp His Thr Lys Leu Ile Arg Gly Pro Leu Met Ala Ala Val  
130 135 140

Thr Tyr Ile Asn Glu Lys Arg Asp Phe Arg Thr Tyr Arg Leu Ser Leu  
145 150 155 160

Leu Glu Glu Tyr Gly Cys Cys Lys Glu Leu Ala Ser Arg Leu Arg Tyr  
165 170 175

Ala Arg Thr Met Val Asp Lys Leu Leu Ser Ser Arg Ser Ala Cys Asn  
180 185 190

Arg Leu Lys Ala Ser  
195

<210> 85  
<211> 210  
<212> PRT  
<213> C. elegans

<400> 85

Pro Val Phe Trp Ile Ser Lys Trp Val Asp Tyr Ser Asp Lys Tyr Gly  
1 5 10 15

Ile Gly Tyr Gln Leu Cys Asp Asn Ser Val Gly Val Leu Phe Asn Asp  
20 25 30

Asn Ser Arg Ile Met Leu Asp Gln Ala Gly Asn Glu Leu Thr Tyr Ile  
35 40 45

Glu Lys Ser Asn Lys Glu His Tyr Phe Ser Met His Ser Gly Glu Met  
50 55 60

Pro Gly Leu Leu Met Lys Lys Asn Thr Leu Leu Lys Tyr Phe Arg Ser  
65 70 75 80

Tyr Met Asn Asp His Leu Val Lys Ala Gly Glu Gly Ser Glu Gln Arg  
85 90 95

Ala Gly Asp Asp Leu Ala Arg Leu Pro Thr Leu Arg Val Trp Phe Arg  
100 105 110

Thr Lys Ser Ala Ile Val Leu His Leu Ser Asn Gly Thr Val Gln Ile  
115 120 125

Asn Phe Phe Asn Asp His Val Lys Met Met Met Cys Pro Leu Met Gln  
130 135 140

Ala Val Thr Phe Ile Asp Gln Asn Lys Arg Met Leu Thr Tyr Lys Leu  
145 150 155 160

Asn Asn Leu Gln Arg Asn Gly Cys Pro Glu Lys Phe Leu His Arg Leu  
165 170 175

Lys Tyr Ala Lys Thr Met Ile Glu Arg Leu Met Asp Ser Ala Asn Val  
180 185 190

Val Ser Gln Asn Pro Ala Arg Gln Pro Asp Met Pro Arg Ser Met Ala  
195 200 205

Ala Ala  
210

<210> 86  
<211> 189  
<212> PRT  
<213> Drosophila laevis

<400> 86

Pro Leu Phe Trp Ile Ser Lys Trp Val Asp Tyr Ser Asp Lys Tyr Gly  
1 5 10 15

Phe Gly Tyr Gln Leu Cys Asp Glu Gly Ile Gly Val Met Phe Asn Asp  
20 25 30

Thr Thr Lys Leu Ile Leu Leu Pro Asn Gln Ile Asn Val His Phe Ile  
35 40 45

Asp Lys Asp Gly Lys Glu Thr Tyr Met Thr Thr Thr Asp Tyr Cys Lys  
50 55 60

Ser Leu Asp Lys Lys Met Lys Leu Leu Ser Tyr Phe Lys Arg Tyr Met  
65 70 75 80

Ile Glu His Leu Val Lys Ala Gly Ala Asn Asn Val Asn Ile Glu Ser  
85 90 95

Asp Gln Ile Ser Arg Met Pro His Leu His Ser Trp Phe Arg Thr Thr  
100 105 110

Cys Ala Val Val Met His Leu Thr Asn Gly Ser Val Gln Leu Asn Phe  
115 120 125

Ser Asp His Met Lys Leu Ile Leu Cys Pro Arg Met Ser Ala Ile Thr  
130 135 140

Tyr Met Asp Gln Glu Lys Asn Phe Arg Thr Tyr Arg Phe Ser Thr Ile  
145 150 155 160

Val Glu Asn Gly Val Ser Lys Asp Leu Tyr Gln Lys Ile Arg Tyr Ala  
165 170 175

Gln Glu Lys Leu Arg Lys Met Leu Glu Lys Met Phe Thr  
180 185

<210> 87  
<211> 198  
<212> PRT  
<213> Xenopus laevis

<400> 87

Pro Ile Phe Trp Ile Ser Lys Trp Val Asp Tyr Ser Asp Lys Tyr Gly  
1 5 10 15

Leu Gly Tyr Gln Leu Cys Asp Asn Ser Val Gly Val Leu Phe Asn Asp  
20 25 30

Ser Thr Arg Leu Ile Met Tyr Asn Asp Gly Asp Ser Leu Gln Tyr Ile  
35 40 45

Glu Arg Asn Asn Thr Glu Ser Tyr Leu Asn Val Arg Ser Tyr Pro Thr  
50 55 60



Thr Leu Thr Lys Lys Ile Thr Leu Leu Lys Tyr Phe Arg Asn Tyr Met  
65 70 75 80

Ser Glu His Leu Leu Lys Ala Gly Ala Asn Thr Thr Pro Arg Glu Gly  
85 90 95

Asp Glu Leu Ala Arg Leu Pro Phe Leu Arg Thr Trp Phe Arg Thr Arg  
100 105 110

Ser Ala Ile Ile Leu His Leu Ser Asn Gly Thr Val Gln Ile Asn Phe  
115 120 125

Phe Gln Asp His Thr Lys Ile Ile Leu Cys Pro Leu Met Ala Ala Val  
130 135 140

Ser Tyr Ile Asp Glu Lys Arg Glu Phe Arg Thr Tyr Lys Leu Ser Leu  
145 150 155 160

Ile Gln Glu Phe Gly Cys Cys Lys Glu Leu Ala Ser Arg Leu Arg Tyr  
165 170 175

Ala Arg Thr Met Val Glu Lys Leu Gln Ser Ser Lys Ser Ala Val Ala  
180 185 190

His Val Lys Ala Ser Ala  
195

<210> 88  
<211> 195  
<212> PRT  
<213> Helicobacter pylori

<400> 88

Pro Ile Leu Trp Val Ser Lys Trp Val Asp Tyr Ser Asp Lys Tyr Gly  
1 5 10 15

Leu Gly Tyr Gln Leu Cys Asp Gly Ser Val Gly Val Leu Phe Asn Asp  
20 25 30

Ser Thr Arg Leu Leu Leu His Ala Asn Ala Asp Thr Leu Glu Tyr Ile  
35 40 45

Glu Arg Asp Gly Asn Glu Lys Tyr Cys Arg Leu Gly Ser Tyr Asp Ser  
50 55 60

Thr Leu His Lys Lys Val Thr Leu Leu Lys Tyr Phe Arg Asn Tyr Met  
65 70 75 80

Ser Glu His Leu Leu Lys Ala Gly Ala Ala Met Thr Pro Arg Glu Ser  
85 90 95

Asp Ser Met Ala Arg Leu Pro Phe Leu Gln Ser Trp Phe Arg Thr Lys  
100 105 110

Ser Ala Ile Val Leu His Leu Ser Asn Gly Thr Val Gln Ile Asn Phe  
115 120 125

Phe Glu Asp His Thr Lys Leu Ile Val Cys Pro Met Met Gly Ala Ala  
130 135 140

Thr Tyr Ile Asp Ala Lys Arg Asn Phe Arg Thr Phe Arg Leu Asn Leu  
145 150 155 160

Ile Glu Lys His Gly Cys Thr Pro Asp Leu Tyr Asp Arg Ile Lys Tyr  
165 170 175

Ala Asn Asn Met Val Lys Asn Met Leu Asp Lys Lys Thr Thr Thr Ala  
180 185 190

Ala Ala His  
195

<210> 89  
<211> 186  
<212> PRT  
<213> Homo sapiens

<400> 89

Ser Phe Gln Trp Val Thr Lys Trp Val Asp Tyr Ser Asn Lys Tyr Gly  
1 5 10 15

Phe Gly Tyr Gln Leu Ser Asp His Thr Val Gly Val Leu Phe Asn Asn  
20 25 30

Gly Ala His Met Ser Leu Leu Pro Asp Lys Lys Thr Val His Tyr Tyr  
35 40 45

Ala Glu Leu Gly Gln Cys Ser Val Phe Pro Ala Thr Asp Ala Arg Glu  
50 55 60

Gln Phe Ile Ser Gln Val Thr Val Leu Lys Tyr Phe Ser His Tyr Met  
65 70 75 80

Glu Glu Asn Leu Met Asp Gly Gly Asp Leu Pro Ser Val Thr Asp Ile  
85 90 95

Arg Arg Pro Arg Leu Tyr Leu Leu Gln Trp Leu Lys Ser Asp Lys Ala  
100 105 110

Leu Met Met Leu Phe Asn Asp Gly Thr Phe Gln Val Asn Phe Tyr His  
115 120 125

Asp His Thr Lys Ile Ile Ile Cys Ser Gln Asn Glu Glu Tyr Leu Leu  
130 135 140

Thr Tyr Ile Asn Glu Asp Arg Ile Ser Thr Thr Phe Arg Leu Thr Thr  
145 150 155 160

Leu Leu Met Ser Gly Cys Ser Ser Glu Leu Lys Asn Arg Met Glu Tyr  
165 170 175

Ala Leu Asn Met Leu Leu Gln Arg Cys Asn  
180 185

<210> 90  
<211> 186  
<212> PRT  
<213> Mus musculus

<400> 90

Ser Phe Gln Trp Val Thr Lys Trp Val Asp Tyr Ser Asn Lys Tyr Gly  
1 5 10 15

Phe Gly Tyr Gln Leu Ser Asp His Thr Val Gly Val Leu Phe Asn Asn  
20 25 30

Gly Ala His Met Ser Leu Leu Pro Asp Lys Lys Thr Val His Tyr Tyr  
35 40 45

Ala Glu Leu Gly Gln Cys Ser Val Phe Pro Ala Thr Asp Ala Pro Glu  
50 55 60

Gln Phe Ile Ser Gln Val Thr Val Leu Lys Tyr Phe Ser His Tyr Met  
65 70 75 80

Glu Glu Asn Leu Met Asp Gly Gly Asp Leu Pro Ser Val Thr Asp Ile  
85 90 95

Arg Arg Pro Arg Leu Tyr Leu Leu Gln Trp Leu Lys Ser Asp Lys Ala  
100 105 110

Leu Met Met Leu Phe Asn Asp Gly Thr Phe Gln Val Asn Phe Tyr His  
115 120 125

Asp His Thr Lys Ile Ile Ile Cys Asn Gln Ser Glu Glu Tyr Leu Leu  
130 135 140

Thr Tyr Ile Asn Glu Asp Arg Ile Ser Thr Thr Phe Arg Leu Thr Thr  
145 150 155 160

Leu Leu Met Ser Gly Cys Ser Leu Glu Leu Lys Asn Arg Met Glu Tyr  
165 170 175

Ala Leu Asn Met Leu Leu Gln Arg Cys Asn  
180 185

<210> 91  
<211> 186  
<212> PRT  
<213> Rattus norvegicus

<400> 91

Ser Gly Gln Trp Val Thr Lys Trp Val Asp Tyr Ser Asn Lys Tyr Gly  
1 5 10 15

Phe Gly Tyr Gln Leu Ser Asp His Thr Val Gly Val Leu Phe Asn Asn  
20 25 30

Gly Ala His Met Ser Leu Leu Pro Asp Lys Lys Thr Val His Tyr Tyr  
35 40 45

Ala Glu Leu Gly Gln Cys Ser Val Phe Pro Ala Thr Asp Ala Pro Glu  
50 55 60

Gln Phe Ile Ser Gln Val Thr Val Leu Lys Tyr Phe Ser His Tyr Met  
65 70 75 80

Glu Glu Asn Leu Met Asp Gly Gly Asp Leu Pro Ser Val Thr Asp Ile  
85 90 95

Arg Arg Pro Arg Leu Tyr Leu Leu Gln Trp Leu Lys Ser Asp Lys Ala  
100 105 110

Leu Met Met Leu Phe Asn Asp Gly Thr Phe Gln Val Asn Phe Tyr His  
115 120 125

Asp His Thr Lys Ile Ile Ile Cys Asn Gln Asn Glu Glu Tyr Leu Leu  
130 135 140

Thr Tyr Ile Asn Glu Asp Arg Ile Ser Thr Thr Phe Arg Leu Thr Thr  
145 150 155 160

Leu Leu Met Ser Gly Cys Ser Leu Glu Leu Lys His Arg Met Glu Tyr  
165 170 175

Ala Leu Asn Met Leu Leu Gln Arg Cys Asn  
180 185

<210> 92  
<211> 214  
<212> PRT  
<213> C. elegans

<400> 92

Pro Ile Phe Trp Val Ser Gln Trp Val His Phe Pro Asn His Gly Ile  
1 5 10 15

Gly Tyr Arg Leu Cys Glu Asn Ser Ser Gly Met Leu Phe Asn Asp Asn  
20 25 30

Thr Gln Met Lys Val Asn Ser Ala Gly Asn Gln Leu Thr Phe Val Asp  
35 40 45

Glu Asn Asn Thr Glu Gln Phe Tyr Thr Met Asn Asp Gln Val Pro Met  
50 55 60

Asn Leu Gln Thr Lys Ile Asn Ile Phe Ser Asn Val Gln Ser Tyr Met  
65 70 75 80

Asn Thr His Leu Glu Ala Asp Thr His Leu Glu Ala Glu Asp Gln Cys  
85 90 95

Val Asn Lys Val Pro Pro Leu Arg Asn Phe Ala Arg Leu Pro Thr Ile  
100 105 110

Gln Asn Trp Phe Glu Thr Lys Ser Ala Val Ile Phe His Leu Ser Asn  
115 120 125

Gly Thr Val Gln Ile Asn Phe Leu Asp His Val Lys Met Val Leu Cys  
130 135 140

Pro Leu Leu Lys Ser Val Thr Phe Ile Glu Glu Asn Lys Arg Val Ser  
145 150 155 160

Thr Phe Thr Phe Ala Asn Ile Leu Thr Asn Ser Cys Pro Lys Lys Tyr  
165 170 175

Leu Ser Arg Ile Glu Tyr Ala Gln Ala Lys Ile Lys Leu Leu Arg Pro  
180 185 190

Thr Asn Asn Gln Glu His Val Val Tyr Val Asp Ser Pro Cys Arg Pro  
195 200 205

Thr Thr Ser Asn Thr Ala  
210

<210> 93  
<211> 187  
<212> PRT  
<213> *Xenopus laevis*

<400> 93

Ser Phe His Trp Val Thr Lys Trp Val Asp Tyr Ser Asn Lys Tyr Gly  
1 5 10 15

Phe Gly Tyr Gln Leu Ser Asp His Thr Val Gly Val Leu Phe Asn Asn  
20 25 30

Gly Ala His Met Ser Phe Leu Pro Asp Lys Lys Thr Val His Tyr Tyr  
35 40 45

Ala Glu Leu Gly Gln Cys Ser Val Phe Pro Ala Thr Glu Ala Pro Glu  
50 55 60

Gln Phe Ile Ser Gln Val Thr Val Leu Lys Tyr Phe Ser His Tyr Met  
65 70 75 80

Glu Glu Asn Leu Met Asp Gly Gly Asp Leu Pro Ser Val Thr Asp Val  
85 90 95

Cys Arg Pro Arg Leu Tyr Leu Leu Gln Trp Leu Lys Ser Asp Lys Ala  
100 105 110

Leu Met Met Leu Phe Asn Asp Gly Thr Phe Gln Val Asn Phe Tyr His  
115 120 125

Asp His Thr Lys Ile Ile Ile Ala Asn Gln Asn Asp Glu Tyr Val Leu  
130 135 140

Thr Tyr Ile Asn Glu Asp Arg Met Ser Thr Thr Phe His Leu Ser Thr  
145 150 155 160

Leu Leu Ile Ser Gly Cys Ser Pro Asp Leu Arg Gln Arg Leu Arg Tyr  
165 170 175

Ala Leu Arg Leu Leu Arg Asp Arg Ser Pro Ala  
180 185

<210> 94  
<211> 187  
<212> PRT  
<213> Homo sapiens

<400> 94

Pro Leu Val Trp Phe Ser Glu Trp Val Gly Phe Ser Asn Lys Phe Gly  
1 5 10 15

Phe Gly Tyr Gln Leu Ser Ser Arg Arg Val Ala Val Leu Phe Asn Asp  
20 25 30

Gly Thr His Met Ala Leu Ser Ala Asn Arg Lys Thr Val His Tyr Asn  
35 40 45

Pro Thr Ser Thr Lys His Phe Ser Phe Ser Val Gly Ala Val Arg Arg  
50 55 60

Ala Leu Gln Pro Gln Leu Gly Ile Leu Arg Tyr Phe Ala Ser Tyr Met  
65 70 75 80

Glu Gln His Leu Met Lys Gly Gly Asp Leu Pro Ser Val Glu Glu Val  
85 90 95

Glu Val Pro Ala Pro Pro Leu Leu Leu Gln Trp Val Lys Thr Asp Gln  
100 105 110

Ala Leu Leu Met Leu Phe Ser Asp Gly Thr Val Gln Val Asn Phe Tyr  
115 120 125

Gly Asp His Thr Lys Leu Ile Leu Ser Gly Trp Glu Pro Leu Leu Val  
130 135 140

Thr Phe Val Ala Arg Asn Arg Ser Ala Cys Thr Tyr Leu Ala Ser His  
145 150 155 160

Leu Arg Gln Leu Gly Cys Ser Pro Asp Leu Arg Gln Arg Leu Arg Tyr  
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Ala Leu Arg Leu Leu Arg Asp Arg Ser Pro Ala  
180 185

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<213> Mus musculus

<400> 95

Pro Leu Val Trp Val Ser Lys Trp Val Asp Tyr Ser Asn Lys Phe Gly  
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Phe Gly Tyr Gln Leu Ser Ser Arg Arg Val Ala Val Leu Phe Asn Asp  
20 25 30

Gly Thr His Met Ala Leu Ser Ala Asn Arg Lys Thr Val His Tyr Asn  
35 40 45

Pro Thr Ser Thr Lys His Phe Ser Phe Ser Met Gly Ser Val Pro Arg  
50 55 60



Ala Leu Gln Pro Gln Leu Gly Ile Leu Arg Tyr Phe Ala Ser Tyr Met  
65 70 75 80

Glu Gln His Leu Met Lys Gly Gly Asp Leu Pro Ser Val Glu Glu Ala  
85 90 95

Glu Val Pro Ala Pro Pro Leu Leu Leu Gln Trp Val Lys Thr Asp Gln  
100 105 110

Ala Leu Leu Met Leu Phe Ser Asp Gly Thr Val Gln Val Asn Phe Tyr  
115 120 125

Gly Asp His Thr Lys Leu Ile Leu Ser Gly Trp Glu Pro Leu Leu Val  
130 135 140

Thr Phe Val Ala Arg Asn Arg Ser Ala Cys Thr Tyr Leu Ala Ser His  
145 150 155 160

Leu Arg Gln Leu Gly Cys Ser Pro Asp Leu Arg Gln Arg Leu Arg Tyr  
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Ala Leu Arg Leu Leu Arg Asp Gln Ser Pro Ala  
180 185

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Pro Leu Val Trp Val Ser Lys Trp Val Asp Tyr Ser Asn Lys Phe Gly  
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Phe Gly Tyr Gln Leu Ser Ser Arg Arg Val Ala Val Leu Phe Asn Asp  
20 25 30

Gly Thr His Met Ala Leu Ser Ala Asn Arg Lys Thr Val His Tyr Asn  
35 40 45

Pro Thr Ser Thr Lys His Phe Ser Phe Ser Val Gly Ser Val Pro Arg  
50 55 60

Ala Leu Arg Pro Gln Leu Gly Ile Leu Arg Tyr Phe Ala Ser Tyr Met  
65 70 75 80

Glu Gln His Leu Met Lys Gly Gly Asp Leu Pro Ser Val Glu Glu Val  
85 " 90 95

Glu Val Pro Ala Pro Pro Leu Leu Leu Gln Trp Val Lys Thr Asp Gln  
100 105 110

Ala Leu Leu Met Leu Phe Ser Asp Gly Thr Val Gln Val Asn Phe Tyr  
115 120 125

Gly Asp His Thr Lys Leu Ile Leu Ser Gly Trp Glu Pro Leu Leu Val  
130 135 140

Thr Phe Val Ala Arg Asn Arg Ser Ala Cys Thr Tyr Leu Ala Ser His  
145 150 155 160

Leu Arg Gln Leu Gly Cys Ser Pro Asp Leu Arg Gln Arg Leu Arg Tyr  
165 170 175

Ala Leu Arg Leu Leu Arg Asp Gln Ser Pro  
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His Phe Val Trp Val Ser Lys Trp Val Asp Tyr Ser Asn Lys Tyr Gly  
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Phe Gly Tyr Gln Leu Ser Asn Arg Ser Ile Gly Val Leu Phe Asn Ser  
20 25 30

Gly Thr His Met Val Phe Pro Ala His Arg Arg His Val His Tyr Asn  
35 40 45

Leu Thr Asn Ser Arg His Phe Val Pro Thr Ser Thr Val Pro Glu Gln  
50 55 60

Leu Gln Gly Gln Met Ser Ile Leu Gln Tyr Phe Ala Thr Tyr Met Glu  
65 70 75 80

Lys Asn Leu Met Lys Gly Gly Asp Leu Pro Cys His Glu Glu Gly Ser  
85 90 95

Gln Ala Pro Leu Leu Leu Leu Gln Trp Val Lys Thr Glu His Ala Leu  
100 105 110

Leu Met Leu Phe Ser Asn Gly Thr Leu Gln Val Asn Phe Tyr Asn Asp  
115 120 125

His Thr Lys Ile Ile Leu Cys Lys Pro Gln Asp Ala Tyr Leu Leu Thr  
130 135 140

Tyr Ile Asn Arg Asp Arg Asn Ser Gln Thr Phe Leu Leu Ser Thr Leu  
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Ala Gln Thr Gly Cys Asn Ser Glu Met Tyr His Arg Leu Lys Tyr Thr  
165 170 175

Val Lys Leu Leu Gln Gln Lys Ala Glu Ser  
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<400> 98

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Asp Thr Ser Leu Leu Phe Ser Ala Asp Glu Glu Val Val Glu Tyr Ala  
35 40 45

Leu His Pro Lys Asp Thr Glu Ile Lys Pro Tyr Ile Tyr Pro Ala Ser  
50 55 60

Lys Val Pro Glu Ser Ile Arg Ser Lys Leu Gln Leu Leu Lys His Phe  
65 70 75 80

Lys Ser Tyr Met Gly Gln Asn Leu Ser Lys Ala Val Gln Asp Glu Ser  
85 90 95

Phe Glu Lys Pro Lys Asn Ser Thr Ser Asn Thr Met Leu Phe Met Gln  
100 105 110

His Tyr Leu Arg Thr Arg Gln Ala Ile Met Phe Arg Leu Ser Asn Gly  
115 120 125

Ile Phe Gln Phe Asn Glu Leu Asp His Arg Lys Val Val Ile Ser Ser  
130 135 140

Thr Ala Arg Lys Ile Ile Val Leu Asp Lys Glu Arg Glu Arg Val Glu  
145 150 155 160

Leu Pro Leu Gln Glu Ala Ser Ala Phe Ser Glu Asp Leu Arg Ser Arg  
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Leu Lys Tyr Ile Arg Glu Thr Leu Glu Ser Trp Ala Ser Lys Met Glu  
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Val Ser

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Gly Thr Thr Val Leu Arg Leu Ala Asp Ala Glu Glu Phe Trp Tyr Ile  
35 40 45

Ser Tyr Asp Asp Arg Glu Gly Trp Val Ala Ser His Tyr Leu Leu Ser  
50 55 60

Glu Lys Pro Arg Glu Leu Ser Arg His Leu Glu Val Val Asp Phe Phe  
65 70 75 80

Ala Lys Tyr Met Lys Ala Asn Leu Ser Arg Val Ser Thr Phe Gly Arg  
85 90 95

Glu Glu Tyr His Lys Asp Asp Val Phe Leu Arg Arg Tyr Thr Arg Tyr  
100 105 110

Lys Pro Phe Val Met Phe Glu Leu Ser Asp Gly Thr Phe Gln Phe Asn  
115 120 125

Phe Lys Asp His His Lys Met Ala Ile Ser Asp Gly Gly Lys Leu Val  
130 135 140

Thr Tyr Ile Ser Pro Ser His Glu Ser Thr Thr Tyr Pro Leu Val Glu  
145 150 155 160

Val Leu Lys Tyr Gly Glu Ile Pro Gly Tyr Pro Glu Ser Asn Phe Arg  
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Glu Lys Leu Thr Leu Ile Lys Glu Gly Leu Lys Gln Lys Ser Thr Ile  
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Val Thr Val Asp  
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5

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<210> 106

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<400> 107

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| Xaa | Tyr | Xaa | Xaa | Xaa | Gln | Xaa | Xaa | Pro | Xaa |
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Xaa Xaa Glu Xaa Ser Xaa Xaa Phe Xaa Xaa

1 5 10

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<400> 109

|     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Tyr | Xaa | Xaa | Ser | Xaa | Xaa | Xaa | Pro | Tyr |
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| Xaa | Xaa | Xaa | Xaa | Thr | Xaa | Tyr | Xaa | Xaa | Ala |
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<222> (7)..(7)  
<223> Xaa = Asp, Glu, Met, or Asn

<220>  
<221> MISC\_FEATURE  
<222> (8)..(8)  
<223> Xaa = Cys or Phe

<220>  
 <221> MISC\_FEATURE  
 <222> (9)..(9)  
 <223> Xaa = Asp, Glu, Gly, Lys, or Pro

<220>  
 <221> MISC\_FEATURE  
 <222> (10)..(10)  
 <223> Xaa = Phe, Gly, His, or Lys

<400> 117

|     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Xaa | Xaa | Xaa | Phe | Thr | Gln | Xaa | Xaa | Xaa | Xaa |
| 1   |     |     |     | 5   |     |     |     |     | 10  |

<210> 118  
 <211> 10  
 <212> PRT  
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<220>  
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<220>  
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 <222> (1)..(4)  
 <223> Xaa = any amino acid

<220>  
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 <222> (5)..(5)  
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 <223> Xaa = any amino acid

<220>  
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 <222> (8)..(8)  
 <223> Xaa = Phe, Ile, Leu, Asn, or Tyr

<220>  
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 <222> (9)..(10)  
 <223> Xaa = any amino acid

<400> 118

|     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Xaa | Xaa | Xaa | Xaa | Ser | Xaa | Xaa | Xaa | Xaa | Xaa |
| 1   |     |     |     | 5   |     |     |     |     | 10  |

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 <223> Xaa = Phe or Tyr

<220>  
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 <222> (9)..(9)  
 <223> Xaa = Phe, Ile, Leu, Val, Trp, or Tyr

<220>  
 <221> MISC\_FEATURE  
 <222> (10)..(10)  
 <223> Xaa = any amino acid

<400> 119

Xaa Xaa Xaa Xaa Ser Xaa Xaa Xaa Xaa Xaa  
 1 5 10

<210> 120  
 <211> 16  
 <212> PRT  
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<220>  
 <223> synthetic

<220>  
 <221> misc\_feature  
 <222> (7)..(7)

<223> Xaa can be any naturally occurring amino acid

<400> 120

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Ala | Ala | Tyr | Asp | Ile | Xaa | Gln | Val | Phe | Pro | Phe | Ala | Lys | Lys | Lys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     | 15  |     |     |

<210> 121

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic

<220>

<221> misc\_feature

<222> (7)..(7)

<223> Xaa can be any naturally occurring amino acid

<400> 121

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Ala | Ala | Tyr | Asp | Ile | Xaa | Gln | Val | Phe | Pro | Phe | Ala | Lys | Lys | Lys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     | 15  |     |     |

<210> 122

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<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic

<400> 122

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Ala | Ala | Tyr | Asp | Ile | Ser | Gln | Val | Phe | Pro | Phe | Ala | Lys | Lys | Lys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     | 15  |     |     |

<210> 123

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic

<400> 123

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Ala | Ala | Tyr | Asp | Ile | Thr | Gln | Val | Phe | Pro | Phe | Ala | Lys | Lys | Lys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     | 15  |     |     |

<210> 124

<211> 16  
<212> PRT  
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<220>  
<223> synthetic

<400> 124

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Ala | Ala | Tyr | Asp | Ile | Ser | Gln | Val | Phe | Pro | Phe | Ala | Lys | Lys | Lys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     | 15  |     |     |

<210> 125  
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<220>  
<223> synthetic

<400> 125

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Ala | Ala | Tyr | Asp | Ile | Ser | Gln | Val | Phe | Pro | Phe | Ala | Lys | Lys | Lys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     | 15  |     |     |

<210> 126  
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<220>  
<223> synthetic

<400> 126

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Ala | Ala | Tyr | Asp | Ile | Thr | Gln | Val | Phe | Pro | Phe | Ala | Lys | Lys | Lys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     | 15  |     |     |